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THE

DENTAL COSMOS:

A

MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

JAMES W. WHITE, M.D., D.D.S.

Observe, Compare, Reflect, Record.

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CONTENTS OF VOL. XV.

ORIGINAL COMMUNICATIONS.

Abrasion and Erosion.................... 461
Aluminium.................................. 625
Alveolar Cysts............................ 231
Another Method of Packing Gold 140
Artificial Appliance..................... 407
Bearing of Development of the Jaws on Irregularities, the........ 292
Canines in Expression, the........... 309
Cases in which Smooth Points are indispensable to the Best Results in filling Teeth........................ 572
Conservative Treatment of the Dental Pulp, the...................... 1
Co-operation of Medical Men with Dentists.................................. 241
Dental Education........................ 25
Dental Pathology and Therapeutics...16, 57, 113, 225, 281, 337, 393, 449, 561, 617
Dentistry in Rio de Janeiro.......... 142
Diagnosis in Neuralgia................ 286
Exposed Dental Pulps.................. 129
Facial Region, the...343, 398, 453, 505, 565, 621
Fatal Case at Exeter, the............. 631
Gold Crowns—Porcelain Face...... 289
Gold in Teeth.............................. 136
Ivory Points............................... 124
Large Crown Cavities with Walls Unbroken.............................. 119
Ossified Pulps............................. 62
Our Duty to the Children............ 305
Pathology of Caries..................... 475
Pepsin and Iodoform.................... 636
Portion of a Tooth drawn into the Bronchial Tube; Patient under the influence of Nitrous Oxide Gas.. 478
Published Transactions of the American Dental Association for 1872, the.. 143
Rare Case in Practice, a............... 353
Requirements of Student Life, the.. 22
Should Dental Operations be performed during Pregnancy?........ 401
Three Adjuncts, the..................... 238
Tin in Teeth................................ 301
Treatment of a Case of Irregularity.. 350
Treatment of Exposed Dental Pulps 69
Use of the File............................ 296

PROCEEDINGS OF DENTAL SOCIETIES.

Alabama Dental Association......... 144
American Dental Association...589, 521, 356, 250
American Dental Convention..356, 530, 604
Association of the Alumni of Pennsylvania College of Dental Surgery.. 74
Baltimore College of Dental Surgery.. 247
Boston Dental College................. 251
Brooklyn Dental Society.............. 639
California State Dental Association 484, 248
Chicago Dental Society............... 357
Connecticut State Dental Association.. 490
Connecticut Valley Dental Association.. 34
Dental Alumni Association of Harvard University......................... 246
Dental School of Harvard University.. 252
East Tennessee Dental Association 35
Erratum.................................... 639
Harris Dental Association............ 354
Illinois and Iowa State Dental Societies—Joint Session............... 540
Illinois State Dental Society.......... 247
Kansas State Dental Association... 355
Lake Erie Dental Association....... 610
Maine Dental Society................... 611
Merrimack Valley Dental Association.. 415
Michigan State Dental Association 71
Minnesota State Dental Association.. 487
Missouri Dental College............... 251

New Jersey State Dental Society 486, 311
New Orleans Dental College......... 251
New York College of Dentistry.... 250
New York Fifth District Dental Society.. 73
New York State Dental Society.... 488, 415
Odontographic Society of Pennsylvania..................................558, 416
Oregon State Dental Society....557, 489
Pennsylvania Association of Dental Surgeons..................... 28, 639
Pennsylvania College of Dental Surgery 248
Pennsylvania State Dental Society.. 489, 311
Philadelphia Dental College.....74, 249,
Southern Dental Association...574, 509, 357
Susquehanna Dental Association... 479, 242
Texas State Dental Association..... 638
Washington City Dental Association... 250

CLINICAL REPORTS.

University of Pennsylvania. Service of James E. Garretson, M.D. 36, 75, 357, 409

EDITORIAL.

Annual Gatherings, the............... 369
Another Dental College............... 316
Correction......... 315
Deferred Matter.....................611, 416
Dental Colleges. The Lecture Season.. 560
Elevation of the Profession, the... 41
Eyes have they, but they See not... 254
Legislation in New Jersey regulating the Practice of Dentistry.. 255
Obituary—
  S. B. H. Faught, D.D.S......... 491
  Edward Gage, M.D............... 258
  Cyrus S. Knapp, D.D.S......... 644
  Elijah M. Neall.................... 258
  Dr. A. J. Snead......................259
  Dr. Amos Westcott.............. 490
Oral Surgery.............................. 640
Publisher's Notices—
  New Volume, the.................. 43
Close of the Volume.............. 643
Province of Dentistry, the. 366
Relations of Dentistry to Medicine, the....................................... 78
Relations of Diathesis and Cachexiæ to Dentistry............................ 146
Spring and Fall Courses in the Dental Colleges 155
Structure of the White Blood Corpuscle.. 314
Suspension of the *Dental Times*.... 315
Systemic Derangements manifested in the Mouth............................ 252
Systemic Manifestations of Local Lesions 312
Traffic in Diplomas...................... 43
United States Centennial Commission.. 149
What is Oral Surgery ?................ 558

BIBLIOGRAPHICAL.

Dental Caries and its Causes.......... 255
Introduction to the Study of Practical Histology........................ 611
Manual of Dental Mechanics, a.... 369
Manual of Metallurgy, a.............. 612
System of Dental Surgery, a........ 256
Thinkers and Thinking............... 612
Transactions of the California State Dental Association................... 944

CORRESPONDENCE.

American Dental Society of Europe, the.................................. 492
Letter from London..................372, 82

THE RUBBER QUESTION.

Gardner Suit, the........................ 170
Gates Case, the........................... 417
Motion to Dismiss the Appeal in the Gardner Suit, the................ 168
Vulcanite Litigation.................... 614

PERISCOPE.

Abnormal Secretion.................... 151
Abscess due to Caries of the Hard Palate.. 331
Action of Cohesive Foil under the Instrument, the......................... 495
Administration of Anæsthetics, the 380

Amaurosis cured by the Extraction of Fangs 662
American Academy of Dental Science 151
American Odontological Association 85
Anæsthetics and Inhalers 380
Anchylosis of the Lower Jaw 162
Anodyne Colloid 273
Anti-Neuralgic Pills 274
Anti-Neuralgic Snuff 663
Anti-Rust Varnish for Iron and Steel 164
Anti-Scorbutic Gargle 274
Artificial Crowns 657
Beads for Retaining Rubber Dam 101
Bleached Tincture of Iodine 49
Bronzing Small Articles of Iron 663
Brown-Séquard's Neuralgic Pill 331
Cancrum Oris 163
Case of Fracture of Alveolar Process 101
Case of Fracture, a 270
Case of Replantation of a Tooth, a 46
Case of Supposed Scurvy in a Nursing Child 381
Cases in Practice 377
Causes of Indigestion 650
Cement 501
Cement for Glass and Porcelain 53
Cement for Handles 333
Cement for Iron 102
Cement to Fasten Wood to other Materials, a 388
Chlorate of Potassa as a Remedy 48
Chloroform and Morphia. Anæsthetic Action combined 93
Chronic Odontalgia Cured by Quinine 652
Clinical Instruction 51
Colored Cements 53
Conservative Dental Surgery in the Army 334
Croton Chloral in Painful Affections of the Fifth Nerve 88
Curious Case, a 271
Death after Extraction of Teeth 99
Death from Nitrous Oxide Gas 327
Death under Chloroform 501
Deaths from Chloroform 267
Deep Air Chambers 656
Degeneracy of the Teeth 152
Degeneracy of the Teeth, the 318
Dental Pepsin 374
Dental Physiology 493
Dentition 646
Detersive Gargle 275
Devitalized Pulp in a Sound Incoming Dens Sapientiæ 270
Diagnosis of Neuralgia 272
Diamond Cement 53
Diploma, the, in Dental Surgery of the Royal College of Surgeons of England 664
Disease of the Maxillary Sinus 45
Dissecting Alveolar Abscess 658
East India Method of Cleaning Silver 164
Easy Method of Roughening Plugger Points, an 501
Eclampsia caused by Uræmia 385
Effect of Stimuli on the Parotid Gland 262
Effects of Syphilis in the Mouth and Teeth 93
Epitheliomatous Tumor of the Upper Maxilla 100
Ergotine; its use subcutaneously in Hemorrhage 652
Excision of Inferior Maxilla 163
Exostosis 653
Exostosis of Alveolar Ridge 270
Facial Neuralgia with Unilateral Sweating 86
Faradisation in Suspended Animation from Chloroform 324
Fistulous Opening on the Face 100
Fluid Extract of Aconite as a Local Application 330
Foot and Mouth Disease in the Human Subject 102
Foreign Body in the Œsophagus 662
For keeping Pathological Specimens 52
Frequent Cause of Neuralgia, a 328
Gangrene of the Mouth 96
Gelseminum in Odontalgia 494
Glycerin as a Solvent 660
Good Cement, a 663
Good Prescription in Facial Neuralgia, a 163
Gutta-Percha 275
Hardening Small Tools 662
Hemorrhage from the Gums 651
Hints on Therapeutics 319
How to Solder Broken Files 663
Ice to the Neck in Hysteria and Suspended Respiration 91
Improvement in Bending Glass Tubes 275
Internal use of Aconite in Neuralgia, the 330
Intra-Buccal Resection 99
Irregularity of Teething diagnostic of Rachitis 261
Isinglass Cement 53
Lancing of the Gums 47
Laudable Discontent 53
Local Anæsthetic, a 274
Local Employment of Chlorate of Potash in Cancerous Sores 655
Malignant Ulceration of Lower Jaw 385
Manufacture of Alloys 660
Mechanical Dentistry 656
Medical Properties of the Bromide of Potassium 90
Method of administering Chloroform 90

Microscope, the 271
Monobromide of Camphor, the 90
More Deaths from Chloroform and from Bichloride of Methylene 50
Natural Cure of Disease, the 273
Nature of Mumps 664
Necrosis of the Body of the Sphenoid Bone; removal 161
Neuralgia 382
Neuralgia; galvanism 330
Neuralgia of Fifth Pair of Nerves; First and Second Branches 45
New Means of relieving Toothache, a 89
New Species of Fossil Elephant, a 54
New Treatment of Exposed Pulp 156
Observations on Secondary Dentine 271
Odontalgia Cured by Quinine 384
Odontocele 331
Offensive Breath 92
On a New Form of Gold Plate for Suction Cases 49
On Cancer of the Sublingual Glands 333
On Oxychloride of Zinc and the Cements allied to it 320
On the Choice of Anæsthetics 324
On the Destruction of Oxychloride of Zinc Fillings 157
On the Primary Dentition of Children 322
Oxychloride 655
Party of the Other Part, the 259
Pathological Dentition 644
Pathology of Anæsthetics 378
Phosphorus in Neuralgia 88
Pill for Neuralgia 164
Pivot Teeth 155
Professional Literature 374
Progress of Dentistry in 1872, the 260
Recent Alleged Death from Ether, the 49
Recent Alleged Death from Nitrous Oxide Gas, the 326
Recent Death under the Administration of Nitrous Oxide, the 263
Recurrent Osseous Tumor of the Lower Jaw 98
Reliable Test of Death, a 51
Remarks on Gout 502
Report on Nitrous Oxide as an Anæsthetic 92
Report your Cases 662
Results of Fruitless Sucking, the 647
Salivary Calculus 93
Salivation from Ether 331
Salivation in the Insane 44
Scurvy in a Child Ten Months Old 332
Sensitive Dentine 273
Shaping Soft Rubber with a File 663
Soldering Iron and Steel 102
Solution for Cleaning Gold and Silver 333
Specialties in Medicine 86
Spontaneous Dislocation of the Jaw from Tongue-Sucking 46
Spontaneous or Chemical Abrasion 659
Stages of Anæsthesia 653
Status of Dentistry in America, the 150
Structure of the White Blood Corpuscle, the 316
Strumous Hypertrophy of the Lip 97
Styptic Collodion 274
Substitute for Oil in Sharpening Tools 164
Syphilitic Infection from Smoking a Cigar 104
Test for Neuralgia dependent on Diseased Teeth 46
To cement Wood to Glass 275
To fasten Leather on Metal 275
To maintain a Constant Stream of Air with Blowpipe 164
To prevent Abrasion of the Cheek from Spiral Springs 660
Tongue-Sucking 99, 100
To remove Rust from Iron 102
Transverse Fracture of a Central Incisor 658
Treatment of Exposed Pulps 267, 376
Treatment of Facial Neuralgia 157
Treatment of Fracture of Inferior Maxillary Bone 163
Treatment of Irregularities of Position in the Permanent Teeth 497
Treatment of Narcosis of Chloroform 664
Treatment of Neuralgia 272
Treatment of Tic Douloureux by Ice 90
Trismus from a Compound Filling 375
Tumor of Jaw 45
Tumor of the Superior Maxilla 661
Ulcerative Stomatitis 332
Use of Hæmatoxylin for staining Animal Tissues 52
Use of the Magnifying Glass in Dental Operations, the 153
Variations in Women's Milk resulting from Insufficient Food 262
Veratrum Viride as a Hæmostatic 274
Waterproof Glue 663
What is the Use? 317
What will make Good Teeth 44
When to Adjust the Rubber Dam 102

HINTS AND QUERIES 54, 105, 165, 275, 335, 389, 502, 665

THE GARDNER SUIT.

Lest there may be some misapprehension respecting the motion (to dismiss the Gardner Appeal) now pending in the Supreme Court of the United States, we deem it proper to say that, upon the filing of the affidavits upon which the motion was based, notice was given to the Goodyear Dental Vulcanite Company and to several of their numerous counsel, some of whom appeared and obtained, upon such appearance, copies of the affidavits.

This was early in November. Since then, upon various grounds, they have asked delays in the presentment of the motion, and have been indulged with the usual allowance for all the circumstances they have adduced as grounds for delay. The matter will be duly submitted upon the testimony taken and to be taken, with such argument as may seem proper in that connection.

In our next issue we may be able to announce the conclusion reached by the Court; but, with our experience of "the law's delay," we can only promise to announce it when it is a fact accomplished.

SAMUEL S. WHITE.

December 24th, 1872.

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ORIGINAL COMMUNICATIONS.

THE CONSERVATIVE TREATMENT OF THE DENTAL PULP.

BY LOUIS JACK, D.D.S., PHILADELPHIA, PA.

(Read before the Odontographic Society of Pennsylvania, Nov. 6th, 1872.)

The dental pulp occupies a small cavity in the middle of each tooth, having a form closely resembling the external outline of the tooth. The nearness of this resemblance is so reliable, that the judgment may be guided in our approaches to it during an operation by the form of the cusps: if they are pointed, the cornua are correspondingly acute; if they are blunt, less danger of incautiously opening upon the pulp will exist. It diminishes in size with advancing life, by the slow conversion of the dentinal cells, which everywhere cover its surface, into true dentine. It is a body of gelatinous appearance, but without elasticity; its exposed surface is smooth and shining, the color being a pale grayish yellow, inclining to pink, and in health rarely receives more than a small proportion of red corpuscles; its functions not seeming to require an active circulation after the completion of the tooth has been effected. It contains a considerable quantity of colorless fluid, and on desiccation is reduced to a remarkably small residue. The union between the pulp and dentine is not firm, and is, excepting at and near the cornu, easily separated from the latter. The blood-vessels are abundant, and arise by straight lines from the foramen to the coronal part, sending out fine capillary loops to the dentinal cells at the periphery of the pulp. The supply of nerves is also abundant; they enter beside the vessels, follow their course, and "form a rich plexus of rhomboidal meshes upon the coronal surface of the pulp." The question whether terminal filaments of nerves enter the tubuli and form a portion of their contents still remains undetermined, and in the present state of knowledge must be held as a postulate; but the weight of analogy and the appearances presented, strongly support the view that dentinal sensibility is due to the presence at the periphery of the dentine of nervous tissue. The function of the pulp after the completion of a tooth is of a passive and vegetative character, its surrounding parts requiring probably no exchange of substance, and seems to be confined, mainly, to maintaining the normal function of the tubular contents. The sensibility of this organ in a state of perfect health to simple touch is not great,—permitting contact, and even incision, providing *pressure is not made*,—but after irritation of any character has continued for a short time, there is probably no portion of the body which is more impatient of contact or from which the mind shrinks with greater aversion.

The dental pulp when exposed or reached by caries of the tooth is placed in a pathological condition thereby, and requires treatment to preserve the tooth from loss. The treatment of the dental pulp has, until within a few years, been specifically applied by a misuse of terms to its devitalization, and only within a short time has any reasonable promise been offered of a more kind and salvable management of this organ when uncovered, or in a state of serious disturbance.

That this is a subject of considerable interest is manifested by the attention with which it has frequently occupied the minds of thinking persons, and also by the various methods which have been proposed and put in practice from time to time, during the whole history of the specialty of dental surgery. Notwithstanding the general practice has, from the character of the usual results of the attempts to preserve the vitality of the pulp, been decidedly against the reliability of such an effort; I have, as the result of my experience, become convinced that the pulp is amenable to conservative treatment, and that profit is to be derived from an earnest discussion of the subject. It has not escaped the notice of many that of late the largest claims in this direction have been made; but they have been generally accompanied by reports of universal success, in a field where, least of all universal success could by any possibility be expected. There has also been a deficiency in describing the details of treatment, and, what is still less satisfactory, a want of careful report of individual cases, giving name of organ, cause of irritation, symptoms and course of pathological disturbance, progress of cure, and, finally, the conclusive evidence of reparative effort, the *crucis experimentum*, the presence of newly-formed dentine at the point of exposure.

Before this paper shall have been completed, many facts and some application of principles will be stated, which will, at least, present the subject for serious thought, in a manner which may provoke examination and discussion in different directions from any hitherto pursued; and which should disarm the opposition of those who have looked with unfavorable prejudice upon any one who has publicly claimed success in any mode of conservatively treating the exposed dental pulp.

Attentive interest is also claimed to the report of a number of actual cases which will be given directly from the note-book, as recorded at the time of treatment. The examination of the phases of each, and the illustrations they present of the value of the principles made use of, and the general plan of the mode of treatment, may not fail to be of some use.

The desirability of retaining the vitality of the pulp is too manifestly simple a question to require argument. That it is demanded of the surgeon to attempt to preserve every organ of the body, is a principle too patent to be discussed, and it must be applied to the small member now under consideration The results of the common method of devitalizing and removing the pulp, even when properly and very carefully performed, are not frequently of an entirely satisfactory character. While comparative comfort may be secured to a tooth after the pulp-chamber has been so completely filled as to prevent this cavity from becoming the receptacle of effusions, thereby excluding the irritating effects of the expansion of gases occasioned by the decomposition of these effusions, it cannot be denied that the tooth has a sense of weakness; that discoloration frequently ensues; that it is liable to attacks of inflammation of the peridental membrane; that it is more liable to caries; that the effects of carious action are more disastrous, and, finally, that, even when unattacked by caries, from the gradual weakening of cohesion, premature loss is liable to happen by fractures. These reasons alone should constrain, if no higher principle was actuative, to the employment of some conservative treatment which would promise the preservation of a moderate percentage of pulps.

It would appear from the general conduct of many who have approached the pulp while in a state of disturbance consequent on its exposure, that it is an organ impatient of treatment and incapable of obeying the laws which everywhere else in the animal economy do not fail to assert their power to secure the ends of self-preservation and repair; and so general has been this impression that not until recently, excepting by a few practitioners, has any thought been entertained except to take the life of the dental pulp by various violent means. In making this statement, it should not be omitted that no other promising method of treatment had been proposed; neither, until late years, has histological knowledge advanced to such a state as to shed reliable light upon any other course; neither had the necessary experience of the action of therapeutical agents upon the pulp and surrounding tissues sufficiently accumulated.

DISTURBANCE OF THE PULP.

When any tooth has become subject to carious action, it is quickly manifest at the outset of the decomposing process upon the periphery of the dentine, that the pulp is cognizant of the existence of some derangement in its relations. If this body is not itself irritated, certainly its dependencies, the contents of the tubuli, are in this condition; and whether we are to admit the conclusions of Tomes and Beale, that the tubuli are filled with tissue, probably possessing nervous properties, or not, it cannot escape notice that the tubuli have given warning of the encroachment, and proceed in the most methodical manner to protect the pulp from serious irritation, by placing a barrier against the imbibition of extraneous fluids, which would irritate and destroy by their incompatibility. This zone of limitation also diminishes the irritation of the nervous elements of the tubular tissue. I bring this fact forward at this moment as an argument in favor of the ability of the pulp to direct on its surface, as well as at considerable distance from itself, the means of self-preservation. This beautiful and regular action may reasonably be accepted as one of the most conclusive facts in favor of the existence of nervous presence in the dentine, as we must be at a loss to comprehend how so well planned and orderly a process can take place without the controlling influence of nervous power. No sooner, however, is the first zone of defense invaded than a new one is completed, and so on continually until the pulp is so nearly approached as to bring on a new train of symptoms and conditions.

The derangements of the dental pulp which follow the unchecked course of caries are properly divided into three classes:

a. Conditions dependent upon the close proximity of caries.

b. Conditions induced by the actual contact of caries, the pulp remaining covered by the gelatinous residue.

c. Conditions caused by the complete exposure to external irritants, as air, food, pressure, etc.

Each of these classes requires separate consideration, as each is accompanied by symptoms and effects peculiar to its class and distinct from the others. They also demand varied treatment.

1. *Conditions dependent upon the near proximity of caries.*—It has been noticed that during the whole progress of caries there has continued some irritation of the tooth, and when this action has passed at some point beyond the last zone of consolidated dentine a somewhat disturbed state of the pulp arises. These conditions are apparently excited by an increase of the irritation which has slightly affected the pulp from the inception of the carious action. This increased irritation is probably occasioned by some portion of the fluids of the cavity finding its way through the remaining thin and partially softened partition of dentine. At this stage, when the pulp is so nearly reached, the moment quickly arrives when a number of the tubuli are without ob-

struction, and when their contents will be viewed, in the field of treatment at least, as real prolongations of the pulp proper. It has been shown that the processes from the dentinal cells enter the dentine. Nothing more seems to be wanting to establish the force of the few lines above than sufficient repetition of microscopical observation to place the purpose of these processes beyond question.

The *symptoms* of this condition usually are a frequent sense of uneasiness in the tooth, not amounting to pain. The patient will frequently express a sense of consciousness of the organ; and this feeling may be noticed at any time of the day, happens spontaneously and without any regularity. In some cases of very susceptible persons, however, it is not uncommon at this stage to have acute pain, which is generally referred to the affected organ. Patients will not unfrequently apply, expressing a desire to have certain teeth re-examined which have passed examination, in which, on the proximal surface, caries is so far advanced as to nearly reach the pulp.

The treatment of this class of cases is in no sense novel; but correct management of this subject would not permit an omission of it. It is exceedingly simple, and results always, if no error is made in the diagnosis, in an entire cessation of the disturbance and the preservation of the pulp. Yet, simple as are the indications for some treatment being applied, a disregard of the necessities of the teeth in this condition is entirely too common, resulting frequently in disorganization of the pulp. The tooth should not be permanently closed at once, but temporarily filled with some material of a plastic nature, which possesses no irritating qualities.

The softer caries only should be removed from the deeper parts of the cavity, the edges being so far prepared as to admit of perfect closure, and the surface of the cavity treated with pure carbolic acid. The material usually best adapted for this temporary filling is what is known as Hill's stopping, allowing it to remain for from a half to one year. The effect of carbolic acid in this strength is to completely arrest any putrefactive changes in the remaining decay, and to coagulate the albuminous elements at the ends of any of the unobstructed tubuli.

This simple and reliable treatment preserves the pulp from the irritations which must ensue on an attempt to entirely remove the caries which, at or near the cornu, may have too closely approached dangerous ground.

The unnecessary removal of the last layer of decay, by its rudeness, however carefully performed, drags outward the tubular contents, and is a precarious step at this stage of caries. Even should this not be admitted, the close proximation of a permanent filling, by its power of conducting heat, irritates by the constant thermal alternations.

A not uncommon practice in these cases is to interpose some non-conductor beneath the filling. This appears at first sight to be a good course, but in my experience it has not proven reliable practice, since the disposition is unavoidable to remove all, or nearly all, of the carious bone; and, as above mentioned, this is not devoid of danger. I have had much better results where either a slight portion of the gelatinous caries has been permitted to remain under the permanent filling, or in cases of the closest apparent approximation, when I have followed the mode of treatment just described. Certainly at this day we will find but few intelligent practitioners who will advocate the propagation of decay of solid dentine by contact with a layer of gelatine.

This method of treating the front teeth is demanded in all cases where the cavities are only moderately deep, as with these teeth no risks should be accepted by immediately filling the cavity with metal, since there are abundant means at hand of otherwise stopping the progress of the caries. The large number of pulps which are constantly being sacrificed by hurried completion of cases warrants all the attention and time given this branch of the subject.

2. *Conditions induced by the actual approach of caries, the pulp remaining covered by the gelatinous residue.*—The line which separates these two classifications of cases is often exceedingly difficult to determine by diagnostic indications, or even by sight and touch, as frequently it will be found that, in cases where full exposure was not thought to exist, after a more careful examination at one of the cornua slight uncovering has been effected, or after a case has been treated for a proximate exposure that symptoms intervene which prove from their character that the diagnosis was erroneous. One of the chief causes of this difficulty springs from the fact that the pulp may be reached by the carious action and remain in contact with the decay for a considerable period without its health being disturbed. This fact has frequently been observed, but sufficient importance has not been attached to it.

The means by which the actual encroachment of caries may be determined are twofold—by the symptoms and by direct examination. If, after opening the cavity, defining the margins, and removing carefully the greater part of the caries, it is feared from the extent of the cavity that the pulp may, in some degree, be implicated, and no spontaneous pain is found to have existed in the evenings, and on filling the cavity for the moment with some non-conductor, there is no response to the application of cold, and if the pulp is not hurt by pressure with a blunt-ended instrument upon a pellet of lint placed over its position, it may be safely considered that the pulp, however nearly, is not fully in contact with the caries. But on the other hand, should there have been pain at night on the side of the face including the tooth, toward bedtime, or after retiring, although such pain may have been transitory or intermittent, and if, on applying cold to the enamel of the tooth, the cavity being for the moment stopped with some non-conductor, there should be complaint of the cold, it may be concluded that the pulp is fully reached. If any uncertainty may exist it will be decided by the application of pressure as above stated, which test should be avoided unless necessary, for reasons which will further appear. The concurrence of these three symptoms will usually be sufficient to determine the diagnosis. The extreme sensibility of the tooth to cold is one of the most characteristic symptoms of irritation of the pulp, and is entitled to some consideration at this point. The impingement of cold substances is then often found to impress alike all parts of the tooth, the sensation being conveyed by the enamel, and is to be distinguished from that simple sensibility to cold which is experienced at the commencement of caries, and which is localized to the point of carious action. This diagnostic symptom becomes of extreme use in the after-treatment as a means of determining whether the irritation of the pulp is increasing or declining. It would appear to be due to the terminal filaments of the tubular contents being excessively excited by the irritation which has markedly affected the nervous elements of the pulp.

The pathological state of the pulp, in the condition just described of simple exposure unaccompanied by any considerable signs of pain, are not easily made out. It will be found that in most cases the pulp has remained exposed probably for weeks, perhaps for months, without the occurrence of any more pain than will occasionally call the attention of the mind to the condition of the tooth. In very many cases, to the surprise of the operator, on finding full exposure, there has at no time been an attack of toothache. In such cases the utmost alteration from a healthy state which is observable is a slightly hyperæmic one. And, indeed, the surprising want of excitation of the vessels of the pulp after a single attack of severe odontalgia would indicate that the primary cause of the hyperæmia has been entirely due to the nervous irritation, occasioned by some unusual application of irritating fluids, or by compression of foreign substances into the carious cavity; or as a symptomatic reflection of some other bodily disturbance. At the outset of the examination of the case, it is important that reliance be not placed on the simple statements of the patient; but that the tooth be tested and the patient questioned closely as to the different manifestations which may have taken place in the tooth, among the other teeth, and in the face. The fact that the pulp will remain healthy for so long a time as must in most instances be observed, is one of the greatest importance, and indicates that there is less danger to be apprehended in the management of exposed pulps than has usually been accorded. It makes plain what has agreed with my own experience, that the dental pulp is not an organ of high sensibility in its normal condition, and that if it is carefully handled there is but little danger of exciting disturbance.

We come now to the subject of the treatment of these simple exposures.

After carefully removing the softer caries and nearly uncovering the pulp, my practice for some time has been at this step, in case no pain whatever has been previously experienced which could be referred to the tooth under treatment, to apply dilute carbolic acid, not stronger than ten to fifteen per cent., to the remaining layer of half-decomposed and gelatinous residue. I then take a small piece of thin tin or lead which has already been fitted over the floor of the cavity, dip it in a varnish composed of white gutta-percha dissolved in chloroform, apply this to the part intended, and carefully fill with Hill's stopping.

In case there has been pain continued, or frequently intermittent in character, something further must be done. With a light hand—without wounding the pulp—the ultimate layer of caries should be removed. If pain has for several days existed, however slight and evanescent, the nervous irritation has induced hyperæmia, and this condition must be relieved, or else the attempt at operating will but further the irritation, and the determination of blood will be increased to such a degree as to still more exalt the neurotic disturbance by the stimulation of an unusual amount of blood, as well as by the most serious of all conditions to which nervous tissue can be submitted,—its compression within fixed limits. Thus, by reactions between the two principal active elements of the pulp, we will soon have as near a congested state of the organ as the nature and situation of the tissue will permit.

It is necessary then to make use of some remedy to relieve the hyperæmia and stop the determination of blood. This is to be found in the use of aconitum,—the only remedy, so far as I am acquainted with medicaments, which is to the nervous tissue a sedative and at the same time possesses specific action upon the capillary system. The formula I mostly use is tinct. aconiti rad., chloroformum, of each ℥j. This is applied to the point of exposure upon a pellet of lint. The cavity during this and subsequent steps should be kept continuously dry. After removing the aconite I make application of very dilute carbolic acid, of ten to fifteen per cent. as before mentioned, and when the excess of this is taken up by bibulous paper, flow over the point of exposure with a camel's-hair pencil a coating of gutta-percha varnish; when this has dried use a covering of tin or lead as above stated.

The purpose of the carbolic acid is simply to correct any zymotic condition which may be present, and also to check the septic influence of atmospheric contact, which the recent investigations in surgery prove cannot be permitted for a moment without deleterious effect. Carbolic acid, it must not be overlooked, is itself in any state of concentration beyond ten per cent. an irritant, and, while a remarkable corrective of fermentative processes and corrector of pathological proliferations, which it seems to effect by its power of impairing the vitality of sporadic germs to which the simple anatomical elements bear some relation; may when used in greater strength than indicated, become so irritating as actually to sustain the condition for which it is remedially employed. The better strength of the solution of carbolic acid for direct application to the pulp is ten per cent, and the menstruum I prefer is glycerin.

The use of the lead or tin is to protect the pulp from the slightest compression during the introduction of the temporary filling, and it is important to observe previous to the closure of the cavity that there is no fluidity of the dissolved gutta-percha, that this may not be forced upon the pulp; for it should be kept in view as a cardinal principle in the treatment of these cases, that the slightest compression is fatal to successful treatment.

Should the pulp have been wounded, tinct. calendulæ, two drachms to six of water, should be applied immediately.

After the cavity is closed temporarily as described, if the case has been a simple one,—in other words, if there has not been continued or severe odontalgia,—there will be complete comfort; no pain will follow.

When some congestion of the peridental membrane is found present, or takes place during the course of the treatment, the gum should be slightly scarified in the near neighborhood of the tooth, and aconite and chloroform painted upon the scarified surface, or carefully applied upon a pledget of cotton or spunk.

After the case has been properly cared for, it will usually be found that the sensibility to cold transmitted through the enamel will decline. Should disturbance of the pulp subsequently arise, it will be first manifested by impatience to cold air or water. To test this it is sometimes necessary to isolate the tooth from the neighboring ones to prevent confusion, since some others may be sensitive to transmission of heat through recent fillings. This is effected by passing over the tooth a piece of sheet rubber, which will permit the enamel of the tooth under treatment to be tested without confusion.

Should the sensation to cold suddenly pass away, it may be inferred the pulp has from some cause become in part or entirely devitalized. Moderate heat is invariably soothing to simple nervous irritation; but should sensation to greater heat painfully impress the tooth, the indications are unfavorable, and point to considerable disturbance in the supply of blood.

A remote cause of compression is occasioned by the effusion of lymph, which may have been slowly finding its passage through the caries when the layer has become sufficiently permeable to the fluids of the mouth as to permit considerable irritation to take place. Effusion under these circumstances from the surface of the pulp should be considered as a consequence of increased determination of blood, rather than the direct effect of irritation to the exposed point. It is to be expected as one of the necessary results of determination, an escape of a portion of the increased supply of fluid at the easiest point of outlet, namely, the part denuded of healthy dentine, since the determination lessens the capacity of a return by the vein. If this view is correct, as it appears to be, we have not to look far for the means to relieve the effusion: it will be found not in the application of topical astringent remedies, which are liable to afterwards increase the difficulties of treatment, but in the use of substances which will control and diminish the determination of blood; if the nervous irritation is removed, this condition will usually pass away, and with it the difficulty from the consequent.

I have had most success in correcting this condition by the action of aconite, as before mentioned. It should be applied upon a pellet of lint, covered by a cap, and the cavity hermetically sealed until the next day. This is recommended only, when the symptoms and long-continued disturbance will not immediately be removed.

Since my experience has increased in the treatment of this class of cases, I have abandoned the use of any astringent remedy for this condition.

It is important, when the pulp has been completely denuded of all its coverings, that it be not allowed to remain unprotected from the air and the fluids of the mouth; for this reason the edges of the cavity should be so well prepared as to insure the retention of the temporary filling, and for the same reason in cases where the disturbance has been too great to permit an immediate and careful closure, the cavity must still be so far sealed as to exclude all outer influences. A disregard of this caution will entail the consequences and bring about the difficulties which meet us when we come to treat of exposures of the third class.

It will be remembered that for a long period it was thought that success could be reached in the treatment of exposed pulps only by performing what was called "capping the pulp." This was done by arching over it a metallic covering. It was supposed the pulp would not bear the contact of any substance whatever. The argument was used, with apparent force, that as reasonable would it be to expect the cutis vera to accept a false epidermis, as for the dental pulp to tolerate any other covering or protection than the healthy dentine. This statement was made in the face of the fact that pulps do, in many cases, remain in contact with the dead residue of decomposed dentine for long periods without the slightest disturbance. Facts confirming this toleration are so abundant, that no presentation of them is necessary to establish the principle that the dental pulp will accept without irritation the immediate presence of foreign substances which are non-conductors of heat, and are devoid of chemical irritants.

It is essential that the covering, whatever it is, should be in direct contact with the exposed surface, to prevent the least room for the accumulation of gases, or of fluids, to quickly undergo transformations.

It is also essential, and it cannot be too strongly insisted upon, that concentrated medicaments should be avoided. That which is healthy does not require medication, and that which has but slightly departed from the normal standard of health needs but simple treatment.

Of this class of caries, I have under treatment dating back two years—but some are for a longer period—as many as twenty-seven, of which number but one has been a total failure—that is, where I was obliged from my inability to relieve the supervening symptoms to destroy the pulp; and one other is in an unsatisfactory condition. The most of these cases have been repeatedly in my hands during that period. What has surprised me is the remarkable absence in general of pain. But I consider my success in this respect to be due to my careful examination of the patient, and to the thorough watchfulness and cautiousness impressed upon the patient.

The question now arises, What is to be the ultimate result of this treatment? Will the pulp remain alive without histological changes, or will it at any time commence and complete such a reparative effort as will permit a permanent completion of the operation?

It will be naturally expected that if the pulp remains in a healthy condition beneath the filling, that some reparative effort will take place, that at length the conversion of some of the dentinal cells into completed dentine will be effected I have a number of cases to report in which this change has actually occurred, which will be found in the Appendix. How far these few cases establish the principle that this change will generally occur will have to be left, at present, to the judgment and opinion of others and to the conclusions to be derived from the results of further experiences. But these cases certainly show that the expectation is not a delusive one. The experience of others, too, is not wanting in examples of the same character.

It will not fail to be observed that one of the ends kept in view in the treatment here indicated for both classes of cases is the preservation of the integrity of the dentinal cells. To maintain their function by careful manipulation, and to avoid destroying them by escharotic chemicals, are the key-notes of the treatment.

Similar modes of treating disturbed pulp, differing in the therapeutical management and in some of the details, have been pursued by others for some time.—*Vide* "Taft's Operative Dental Surgery," DENTAL COSMOS for 1872.

The plan of treatment indicated in this paper was commenced with the details here given, at the close of 1870, but previously to that, as far back as 1865, without the employment of aconite, and by the use of pure carbolic acid, the fillings being of Hill's stopping, laid upon a layer of undissolved gutta-percha. Of these experiments I have no regular data; many of them were failures, as have been all my attempts to effect cures with oxychloride of zinc coverings of various proportions of chloride of zinc. However fair the latter may have promised at first, the ultimate result has been unfavorable. During the same period a number of cases were treated with hypophosphate of lime, but for want of sufficient experience and disregard of the hyperæmic condition, many were failures.

It should be stated that no unnecessary meddling with teeth during the course of the treatment should be permitted. As long as quietness continues, nothing is needed beyond maintaining the proper fullness of the temporary filling by an occasional renewal of the outer portion; at each repair forbearing to remove more than a necessary part of the filling. A period of three years should elapse before any reasonable expectation is entertained of completing the treatment by a permanent operation. This long delay must deter many who have not entire control of their practice from using so kind a material as gutta-percha, and will force such persons to the use of a metallic substance, for which purpose, with proper caution, tin foil would prove an acceptable substitute after some months have elapsed.

3. *Conditions caused by the complete exposure to external irritants, as air, food, pressure, etc.*—When ultimate denudation of the pulp has taken place, and has continued for some time, the difficulties of the treatment must be very much enhanced; under these circumstances the surface exposed to the air is much more highly charged with blood than is normally the case, and in many instances is in a constant state of effusing lymph, at times pus—in other words, the surface is an ulcer, and is to be treated as such; but so precarious is the management of this class of cases, that no definite rules can be laid down which will be applicable to all of this description. That which will at one time give relief, and permit closure of the cavity, at the next, when the symptoms are similar, and the conditions apparently the same, will be followed by a return of pain, indicating that effused fluids are pressing between the filling and the organ.

Various irritations have asserted themselves, and probably repeated attacks of pain have been suffered, the consequence of severe congestions. Alteration of structure may have taken place, which will never permit the functions of the pulp to be normally carried on. The important changes which have taken place at the point of exposure, where it has been directly acted upon by various deleterious influences, and along the course of the vessels and nerves, if we are to rely upon the investigations of the German observers in a field which has been surprisingly neglected, are of such a nature as to render questionable a proper cure. The dentinal cells over the exposed part are obliterated. The connective tissue has suffered proliferations. The blood-vessels are altered by serious structural changes. The nerve-fibres also have been deranged by the deposition of fat-granules, not only between them, but in their interior. In short all the structural elements of the pulp have undergone changes.*

The destruction of the dentinal cells would appear to render impossible a conversion of this portion of the pulp into true dentine. These odontoblasts studding the whole surface have as their function the maintenance of connection between the deeper pulp tissue and the tubular contents, and also carry on the slow formation of dentine. Histological knowledge, I believe, does not furnish examples of any special organ having definite functions to perform being recreated in the higher organizations. I am at a loss to comprehend how any conversion of the pulp is then to take place, except by the formation of deposits of secondary dentine, which may at length bridge over and become connected with the sides of the pulp capsule. This is questionable, and needs the confirmation of repeated cases accurately observed and carefully reported.

In several instances, I have observed pulps remain in contact with temporary fillings for several years without the slightest apparent change, continuing the meanwhile, however, free from pain.

The general treatment here must be similar to that indicated for the second class where effusion exists. If only of lymph, that plan may be successful; but if pus is present, chloride of zinc, 10 grains to an ounce of water, will be needed, and the part arched over for a day, when aconite should be applied as described, and repeated until the pulp has so far recovered as to permit a covering to be placed immediately upon it. My practice, in this stage, is to cover the part with gold-beaters' skin dipped in carbolic acid, 10 to 15 per cent. (the menstruum being glycerin), there being no excess of the dressing permitted. After a moment this is covered with a disc of tin, dipped in the solution of gutta-percha. The use of the gold-beaters' skin, which is made of the intestine of the ox, is founded on the acceptability of ligatures of similar tissue in surgical operations, of which it is asserted by Liston that they, after being saturated with a solution of carbolic acid, not only are tolerated by the ligated vessels, but actually become united to the tissues, and organized. It also forms a basis on which to place the coating of gutta-percha.

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* Vide "Pathology of the Teeth," by Wedl.

My experience in this class of exposures has been far from satisfactory. Of sixteen cases under treatment within two years, six have been total failures. It became necessary to devitalize several, and others died apparently without pain. Of the same number, two are in an unsatisfactory condition. The remaining eight are, as far as reported, in an entirely comfortable state. My experience in this class, unless more satisfactory means will be pointed out, would incline to the solution of accepting immediate devitalization.

Fortunately, completely denuded pulps do not frequently occur, excepting of teeth which are in other respects so nearly useless that we rarely impair the good of the patient by proceeding at once to the *dernier ressort.* But in regard to the large and important class of exposures of the pulp which are constantly occurring in the treatment of caries, namely, when the pulp has, although reached, not been exposed to septic and zymotic influences, it may safely be concluded that the only proper course at least, is, to make an intelligent and faithful endeavor to preserve the vitality of every part of the tooth.

[APPENDIX.]

To exhibit the successful restoration of dentine at the point of exposure, the following cases are reported:

In September, 1866, found pulp reached by caries in the right inferior first molar, crown surface. Notation at the time as follows: "Pulp found nearly exposed to the air. Applied hypophosphate of lime in glycerin, covered with gutta-percha and filled temporarily with amalgam." There was no disturbance of any moment after a few hours. The case was examined from time to time, until, on January 25th, 1872, it was opened on account of a defect in the amalgam. After removing this, found the cavity half filled with gutta-percha. Under this and immediately over the pulp was a concave mass of gold, beneath which had been placed the hypophosphate of lime. On removing the thin layer of decay, a distinct pulp opening was found. On examining this opening, a solid obstruction was discovered at a depth of the thickness of card-board, which was sensitive as dentine usually is. Pressure was made with force, first with a pledget of wet cotton under an instrument, and then with a bare instrument which caused no sensation, conclusively proving that the pulp had entirely obliterated the exposure. The sensibility of the dentine was complete at all parts, thus manifesting perfect vitality and health of the pulp to its terminal extremities. The size of the original point of exposure was one-twentieth of an inch, and was circular in form.

Mr. T. F. D. Distal surface, first right superior bicuspid, with every symptom of exposure; portion of caries permitted to remain, which was saturated with solution of hypophosphate of lime in glycerin and water. This case remained unopened, excepting an occasional renewal of the worn portion of the Hill's stopping, until September, 1872, when the cavity was perfectly cleansed. At the point of original exposure an undoubted deposit of dentine was discovered. The cavity was then permanently filled. During the long continuance of the temporary filling, no pain had occurred after the first few months.

Miss W. Distal surface of second superior left molar. First presented with indications of exposure in June, 1869. On opening, found this was the case; as the patient was on the point of leaving town, decided to make an attempt to keep the pulp quiet until the autumn. After relieving the pain of opening with aconite, applied carbolic acid and carefully covered with Hill's stopping. Heard no more of the case until nearly a year afterwards, when the patient complained of some pain, which proved to be no more than some slight congestion of the pulp. Opened the tooth, made some slight application, and resatisfied myself of the fact of exposure. Some application was made,—I believe, diluted carbolic acid,—then covered the pulp with a shaving of gutta-percha, and filled with Hill's stopping.

January, 1872 (two years afterward), the case was again in my hands. In the long interim the patient has been twice under inspection, but this tooth was not opened, as it had remained entirely comfortable. Removed the filling and the covering, when the old point of exposure was plainly visible in the midst of a large spot of blackened dentine of hard texture. This point was of considerable size, and was of a clear dentine color, hard, and almost devoid of sensibility; no pain on pressure over the part, and no question but that secondary dentine had been deposited at this part. The margins of the cavity were sensitive, on the buccal side particularly so. The cavity is now closed with gutta-percha, which was inserted without the least caution.

This last is a marked case, as the recovery was complete under circumstances where it was precarious, since the exposure was a broad one.

It may not be unprofitable to repeat the report of a few ordinary cases. The first two of accidental opening.

E. F., crown surface, superior molar. The cavity was on the side of some eburnated dentine. On removing the caries, the pulp was accidentally touched at a hair line which bled. An attempt was made to save the pulp. The part was covered with a layer of gutta-percha dipped in creasote; the cavity was then filled with gold, October 17th, 1863. On March 6th, 1869, the tooth was apparently alive, and has given no trouble. Again in November, 1870, a careful re-examination was made, with every indication of full vitality.

Another case of similar character where the same accident occurred in 1869, has continued to present at each repeated examination the same favorable indications.

The majority of the cases of the second class are so similar that it would be useless to present them, as their report would be but a repetition of the treatment in the text. As none of the cases of the past two years can be expected to have healed by deposition of dentine, none have been opened, except in a couple of instances where accidental escape of the fillings had taken place, in each instance endangering the success of the final result.

The following case is introduced to show the prompt action of aconite upon a suddenly disturbed pulp:

Distal surface of superior molar; first molar. This tooth had been filled with gutta-percha for a year by a former dentist. On removing the filling, it was not noticed that the pulp was implicated, and in syringing the cavity the patient by the contraction of the commissure of the lips forced the pipe of the syringe upon the pulp. There was immediate pain, accompanied by pain in the neighboring teeth. The pulp was in a state of violent pulsation, accompanied directly by the effusion of serum; applied calendula and aconite. As the effusion interfered with an immediate closure, made a dressing of aconite, carbolic acid, and glycerin, and covered for a short time with gutta-percha. At the end of the hour found the pulsation had ceased and the effusion stopped. The case was then closed.

Under ordinary circumstances the last dressing would have been retained for a day. The case has not reported, but, on inquiry, have learned that it has continued well.

DENTAL PATHOLOGY AND THERAPEUTICS.

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(Continued from page 637 of Vol. XIV.)

ERUPTION, OR CUTTING OF THE TEMPORARY TEETH.

DURING the first three stages of tooth formation there is never any systemic derangement which is usually attributed to dentition; neither is there ever any assistance afforded nature in this direction, unless we regard as such the stereotyped dietetic advice and tonic medication which properly belongs to general treatment. It is also not unfrequent that the eruptive stage is passed through by all the teeth in so physiological a manner as to be unnoticed by either attendant or child. This is normal dentition, and in this connection it is customary to give a certain "order of eruption;" but I wish here to state that it is seldom the case that the two occur as concomitants, for, as a rule, the cases in which painless eruption occurs are those in which it takes place later, oftentimes much later, than the accepted normal time. It is entirely unnecessary for me to enter into any lengthy discussion of the various diseases which are usually written of in connection with dentition, for other works, such as Ashburner, Jacobi, Tomes, etc., together with

Ellis's papers in the Dental Cosmos for 1867, '68, and '69, treat of these sufficiently for all practical purposes. I propose therefore confining myself in this, as in all other pathological matters, strictly within the limits of dentistry.

The usual order of eruption for the temporary teeth is: lower central incisors, sixth month; upper central incisors, seventh month; lower lateral incisors, eighth month; upper lateral incisors, ninth month; lower anterior molars, twelfth month (one year); upper anterior molars, thirteenth month; lower cuspids, eighteenth month; upper cuspids, nineteenth month; lower posterior molars, twenty-fourth month (two years); upper posterior molars, twenty-sixth month. This completes the eruption of the deciduous teeth; but it must be remembered that there is frequent deviation from this "usual" time of erupting, and that the deviations are possibly very great. Thus we sometimes find teeth (incisors) erupted at birth, while on the contrary I have several little patients whose teeth did not commence presenting until they were nearly two years of age, and one who was nearly three years old before the appearance of any teeth. In a majority of these cases the upper central incisors were the first teeth to erupt, though in many the usual routine of presentation (lower teeth first) was observed.

Almost invariably, in cases of tardy dentition, after the appearance of the first teeth, the eruption of the subsequent ones proceeds much more rapidly than usual, frequently four, and sometimes six or eight teeth, presenting at once; but even this ordinarily produces very little local and no perceptible constitutional irritation, while the teeth are generally of better than average quality, and markedly maintain their integrity during young life.

When teeth are found erupted at birth, it is not unusual for them to evince little root formation by loosening quickly, and either complete separation occurs or extraction of the loosened tooth is demanded. This operation is sometimes resorted to for the relief of the mother alone, as the child is liable to wound her while nursing; but, on the contrary, it is sometimes the case that neither of these results ensue, the teeth remaining firmly fixed in position, and without annoying the mother. In these cases the other teeth are generally found to present precociously, and usually soon give evidence of their rapid formation in equally premature decay. I have in my collection a lower central incisor (presented by a friend) which was erupted at birth, and extracted, to relieve pain from an *exposed pulp*, when the patient was *one year old.* These instances are, of course, extreme cases, but my experience leads me to the conviction that premature eruption of teeth is unfortunate, instead of being a cause for rejoicing as evidence of extraordinary physical ability, and that these early productions are possessed of correspondingly feeble resisting power, requiring constant watchfulness and attention. On the other hand, except in cases of positively weakly children, whose every indication denotes inability for development, dilatory or tardy eruption is in no wise to be regretted, but rather should be viewed as denoting the probability of a durable and satisfactory denture. Among all the deciduous teeth, I regard the lateral incisors (particularly the superior laterals) as the most unreliable in period of eruption, for these sometimes do not appear until after the anterior molars, and I have noticed several instances where the cuspids were fully erupted before there were any signs of the approaching laterals; but I have never seen a case of the absolute absence of these *deciduous* teeth. It is also worthy of comment that this deviation of the laterals never seems to affect the period of eruption pertaining to the other teeth, so that for all practical purposes this is the only irregularity of eruption which should necessarily be remembered, and this only in order to be able to give the parents of children in which it occurs the assurance that it is a defect which a few months of time will probably remedy.

We have now to consider the *pathological eruption of the deciduous teeth*, as a whole, from the dental stand-point; and when we reflect that the testimony of many eminent general practitioners would lead us to the belief that a large proportion of infantile *mortality* is due to this cause, and when I say that experience proves that the immensity of the amount of irritation, discomfort, and severe sickness, short of mortality, of which this is also the cause, is incredible, except to those who as specialists have had the opportunities for witnessing its alleviation, we may well regard it as one of the most important subjects within the scope of dental pathology. It is well that we should *not* give to dental irritation that overwhelming importance which, while it deceives us with the belief that it is the cause of all infantile woe, impresses others of intelligence with the idea of "narrow specialism;" but at the same time we should know of and remember the frequent instances of serious and long-continued trouble which, during adult life, arise from affections of the teeth, and should never fail to recognize that if neuralgia, blindness, deafness, paralysis, and all the host of grave disorders such as these can come from irritated dental nerves, the possibility and even *probability* exists that *loss of appetite* (the very foundation of infantile trouble), *peevish fretfulness, tossing restlessness, actual wakefulness, feverish thirst, painful paroxysms, severe continuous suffering, bowel difficulties, congestion of the brain, convulsions, emaciation, and death*, may all arise from difficult dentition. Viewing the subject in this light, it is certainly better, in cases of infantile disease which do not seem as amenable as desirable to general treatment, that dental consultation should be indulged in, and it is therefore *expected* from the dentist that he should be familiar with much special minutiæ that is naturally without the scope of the general practitioner. He should remember perfectly the order and period of normal eruption; he should be acquainted with probable deviations from this; he should be able to recognize the *peculiar* signs of distress which are given by the little patients, unable to communicate verbally; he should be able to make a satisfactory and comfortable examination (usually no easy thing to accomplish); he should be conversant with detrimental complications, and be able to inform as to *why* these are so; and in conclusion, he should be able to operate, when it is demanded by the exigencies of the case, in such manner as will best insure present relief and future good.

Having given the order and period of normal eruption, and referred to the character of deviations from this, we will next consider the peculiar indications of pathological dentition. If, when an infant has reached the age of from five to seven months, it shows any signs of difference in feelings from those which are usual to it, and which are not soon explained by the diagnostics pertaining to some one of the many diseases of infancy, it may reasonably be accredited to the effort on the part of the inferior central incisors to erupt; with equal reason, irritation without apparent cause at those periods of infantile life which have been given as usual for the eruption of teeth may be ascribed to dentition; more especially is this true when we find, concomitant with this uneasiness, more or less increase in the flow of saliva, until we have what is termed in nursery language "drooling," which is to drivel or drop saliva; and again a marked desire to suck the thumb or even all the fingers; to bite the mouth-ring, spoon, or whatever it may have to hold, with more of force than as amusement, and evidently for relief; when in desiring unusual attention it prefers the rocking in the lap instead of the cradle, as thus it secures a more upright position to counteract the flow of blood to the already over-supplied teeth and gums; when it requires day after day increasing frequency of change in amusement and position; evinces a gradual indisposition for food, or cries out impatiently, petulantly, or angrily, as it hurts itself in the effort to suck; becomes restless after two or three hours of slumber, and finally declines its daytime sleeping until exhausted with fatigue; when it gradually becomes peevish and fretful, its little face flushes, and it "does not seem like itself," and, notwithstanding the efforts which are now made in earnest to relieve it, the little sufferer gets worse, and the mother grows anxious from love and weary with watching; then *before* the bowels are deranged, *before* the brain becomes disturbed, *before* the babe has suffered torture and the mother's heart has bled, almost *immediate* relief can be afforded.

It sometimes is the case, even thus early, that the gums are examined for redness and tumefaction, and frequently, there being neither, the hidden cause is ignored; but worse than this, it is not unfrequently the case that, redness and tumefaction being present, they are left untouched, because *whiteness* of the gums is not there to indicate the readiness of the tooth to spring through at the slightest touch, and thus prevent a wound from healing and placing "cicatricial tissue, so hard, like a seam," as a more effectual barrier to progress.

Let us refer to diagram 8 of tooth formation, for that is the condition of development in the incipiency of pathological eruption. So soon as that portion of the wall of the bony cell nearest to the overlying stratum of gum has become sufficiently absorbed to permit of the passage of the tooth, that organ commences a comparatively rapid effort to accomplish full eruption, but in its progress it is now impinging upon a structure (gum) which, normally quite tough and senseless, becomes upon irritation, tenderly sensitive; here then we have, according to individual susceptibility, the commencement of a more or less pathological dentition. The edge of the growing tooth becomes a "mechanical irritant," and soon induces that amount of altered nervous and vascular action which eventuates in "determination of blood" to the irritated gum structure; we know that throbbing and increased sensation are the concomitants of this condition, and thus, *without* "*external redness and tumefaction*," we can easily understand why it is that the infant becomes uneasy and "troublesome." But the irritation is not relieved, and we know that as a sequence "congestion" of the part first irritated takes place, together with further determination of blood to the surrounding tissue—we recognize now the complication of dull constant pain and swelling. This swelling of the gum structure (increase in size) must exert greater pressure than before upon the growing tooth, which pressure must in turn act upon the parts at that portion of root which is forming; toward the apex. Now we have a serious complication, for this pressure naturally induces a greater flow of blood where increase of blood will tend to produce increasedly rapid formation of tooth. It is now that the irritation of the trifacial (sensory nerve to the teeth, nutrient to the salivary glands) causes increased flow of saliva. If this condition is not relieved, how can it be otherwise than that inflammation of the gum, together with irritation of the dental pulp, should soon follow, and that the little patient should suffer the agony which we all know accompanies inflammation of these parts? Then the gums *do* become red and tumefied, and still nothing is done because "it is too soon!" From this view it seems almost needless to point to the means of relief, for it is self-evident; it seems strange that the natural blood-letting and removal of pressure from "lancing the gums" should ever have its power denied; it seems strange that "authorities" can be found not only questioning its utility but denying its advisability; it seems strange that medical men and dentists can yet be found who actually believe in the "hardness" of cicatricial tissue; but so it is, and to such, after giving "lancing of the gums" as the operation for the affording of relief, we have to ask—if a lip be cracked in cold weather and it heals, where will it be most liable to crack again? and the experience of all who have any, is, that it separates in the same place; we have to ask, if in any surgical operation or in any cut wound which has been dressed, the pins or adhesive strips are prematurely removed and solution of continuity takes place, where does this occur? and experience teaches that it is invariably at the edges of the wound —that it is the newly-forming tissue which first yields; we have to ask, what tissue first yields even to depressing influences, such as exposure to cold, poor and indifferent food, deprivation of light, etc.? and the reply must be, cicatricial tissue, even of thirty or forty years' standing; and we rest the matter here, upon the ground that no *infant* can possibly have firmer cicatricial tissue than this.

Advising then, as the result of extensive experience, the early and frequent lancing of the gums for the relief of suffering as well as for the saving of life, in cases where such indications as I have given serve to point to the advisability or actual necessity for the operation, it now comes in place to speak of the objections to it, the difficulties encountered in its performance, and the specialists' method of doing it.

In addition to the widely disseminated idea of the increased difficulty of erupting teeth as the inevitable result of the "hard seam" left from lancing, we have the natural dislike upon the part of parents and nurses to the infliction of even necessary suffering upon the little helpless and tender treasures, which are, even when most a care, still the joy of the household,—and this infliction seems to be doubly disagreeable when it assumes the shape of a surgical operation. With this view my *feelings* have always sympathized; I have therefore felt it to be my *duty* to so educate in this direction the parents among my patients while no necessity existed, that when, unfortunately, pathological dentition brought sorrow and suffering upon them and their little ones, they would recognize the existence of the true cause of irritation; would have become conversant with the rational means for the affording of relief, and would have been led to feel that what seemed like cruelty was truly far the lesser of the two evils, and that withholding this means of relief was wrong alike to the suffering children and to themselves. Thus it is, that in hundreds of instances I have been able to demonstrate the marked and almost immediate relief which is afforded by lancing,—thus it is, that in scores of cases where infants had gradually passed from restlessness to dangerous illness, and where, notwithstanding constant medical effort, the ten or fourteen days of suffering had brought them, pale and emaciated, to the very verge of the grave, I have seen them easy in a few hours, and up and out of doors in their nurse's arms in two days, as the result of *no other treatment* than the thorough and, as it proved, effectual lancing of the gums.

(To be continued.)

THE REQUIREMENTS OF STUDENT LIFE.

BY HARRISON ALLEN, M.D.,
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(Abstract of an Introductory Lecture to the Tenth Annual Session, delivered Nov. 4th, 1872.)

This evening we are met together to inaugurate the session for 1872 and '73. It is a subject for congratulation that upon the eve of a Presidential election we can convene quietly, to enter upon a course of professional study.

How many different institutions are now opening their doors! How various are the wants of the numerous body of students who enter therein! From the mission schools where young men are preparing themselves for labor among savage people, to the schools of arts and medicine where the novitiates are for the most part destined to reside among communities which express our highest civilization, we have different wants, and there must be corresponding differences in the material composing the classes themselves.

Among all these assemblages, I think I am speaking within bounds when I say that the dental class is the most distinctive; and it is so for this reason: You are, I take it, a part of that large body of medical students which, however divided, is sitting in pupilage before our faculties of instruction, yet presenting certain features distinct from those found in the medical college proper. The medical class is for the most part composed of young men. You will find, it is true, here and there men of mature years who have returned to their alma mater to renew the studies of their youth; but the majority are those who have recently determined to follow the profession of medicine. The dental class is also composed of young men in great part, but that element which gives individuality to the class is made up of students of a different order: men who are skilled in the practice of their profession; who, now availing themselves of the advantages here afforded them, and actuated by a noble ambition, have determined to secure what, in their younger days, was an impossibility,—the diploma of a dental college. To such the degree of Doctor of Dental Surgery is an honor obtained, as a reward of much labor extending over years,—one which is secured by sacrifice of time, and often by temporary detriment of business interests. Another, and we are glad to say a smaller, element, is that composed of men who are fairly driven to the collegiate hall by the expression of public opinion in the States in which they reside. This voice has said in tones which cannot be mistaken: "We are no longer satisfied; either practice with a diploma, or relinquish your claims to the patronage of this community!"

But in one essential feature all classes are alike. They are classes of *students*. No matter at what age or under what circumstances they assume that title, from the moment the gown and cap of the matriculate are donned, that moment all the several peculiarities of antecedents are lost, and the student becomes one of the file of the uniformed. Let me address myself to such a recruit. Your business is to study. This business is probably new to you, and you must learn it. Systematic study is a branch of knowledge apart from the things studied. Application is not study any more than looking is perceiving. A soldier may go through the regulations of duty, yet lack all the essential features of true soldierly bearing. You may observe all the outward formulæ of student-life, and yet be failures as students. I would impress upon you, therefore, the importance of a quick appreciation of what it is to be a student. Many of you have been pursuing the practice of your profession for years, and yet have given but little time to the cultivation of the faculty of study; many have been in the offices of most able practitioners, and have stood over the operating-chair, or worked with them in the laboratory, and yet have never learned the first principles of a systematic acquirement of knowledge. This indeed is rarely obtained in the office, laboratory, or closet. It is in the college where elaborate schemes of instruction can alone be inaugurated, that this can be efficiently done,—at least in this country. It is in college life that we enjoy the advantage of the friction which is inevitable in bringing together a number of bright and tentative minds engaged in a common pursuit. It is here that we gradually learn the limits of our endeavor; and it is here above all that we obtain a method of arrangement of facts. We cannot teach you all that you must know, but we can give you the habit of mind which is essential to the retention of the facts we offer you, and the best manner of rendering available what you will hereafter acquire.

There are yet other truths in this connection which it would be well for you to remember. You are entering upon a new field of labor, and your task is one of unusual severity; it is not completed by your graduation,—nay, then but undergoes a change,—the task in all its essential features remains. Now consider that it is your nervous system which, after all is said, must stand the brunt of this labor. Much has been said of the wear and tear of modern life, and of its fierce competitions. You cannot expect to escape from the tendency of affairs; you are already drawn into the current and must go along with the rest. I can, however, offer you this consolation, that you have of all the professions the one least apt to exhaust the faculties. Not that its duties are less arduous, but that they are better balanced. We are informed that the brain, when it breaks down, does so chiefly in the direction of the overtasked faculties. True rest, excepting of course that exquisite renovation of all the faculties through sleep, is best secured by change rather than by a general relaxation from labor. And in dentistry we find its different divisions of labor presenting to the devotee that very diversity of occupation which is so essential to health: while yours is an in-door calling it is not sedentary; and the medical relations are nicely balanced by the mechanical. You turn from a problem in chemistry or mechanics in the laboratory to a physico-pathological one in the office. Along the wayside of your strictly limited path of duty lie enticing opportunities for polite learning, in the direction of metallurgy, in biological research, in the equally delightful branches of chemistry.

But unless you enjoy study all this will prove of little avail. We all love to do the thing we can do well. And you will love to acquire knowledge when you know how to go about it. In the first place, let me beseech you to cultivate the habit of attention. Persons who are not trained can concentrate their ideas but for a short time. You see illustrations of this in our churches, as well as in the lecture-room. The faculty of attention is one which you must cultivate, and like all other good things it is capable of cultivation to a high degree. When it is exhausted the mind swerves from the point of attention, and gives itself up to any vaporous whim which may flit across the brain. Trivial things serve to amuse at such a time, when, were the faculties well focused on the subject of the lecture, they would be found too insignificant for notice. Let me urge you, therefore, to avoid all those boyish expressions of amusement that students occasionally indulge in at lecture-time, and remember that they are but different manifestations of inattention.

Another important habit to acquire is that of taking notes. No one can possibly remember all that is said by your lecturers, and much of what is said is not to be found in the books. A navigator who would undertake a voyage without making daily observation of his reckoning would be, you will say, a poor sailor. No one would rely upon the statements of a traveler who would give you an account of his journeyings in strange lands in the shape of statements written out upon his return home. Now, a student who makes no daily record of his progress, or what he hears and observes, is likely to prove as indifferent a voyager through life as the one, and as unreliable an authority as the other. No matter how many cases a practitioner may have seen, he can retain but a general impression of them, unless a written record of all their varying phases has been kept. As your note-books will prove in the early years of your experience invaluable, they will serve you many a good turn in your pupilage; "for though memory may sometimes fail, yet the written letter remains."

There is yet another subject to which I would invite your attention, viz., that of class ethics: the rules governing the relation between yourselves and the faculty. We will necessarily be thrown much together during the session, and upon the degree of our observance of class ethics much of our harmony of action will depend. No two persons can live for any time together without being judged in their every act by a court in equity. We are powerless to resist the operation of its laws: if we break them we suffer; if we ignore them, one result is inevitable,—discord. You have read our college regulations, and we intend that the main channels of our intercourse will be determined by them. But there is yet a "higher law," which is not expressed therein, nor upon the placards about the college building, nor yet in our announcement, which is indeed unwritten, save in your sense of honor and gentlemanly bearing. Let us all be governed by this high ruling, and we will be sure to enjoy to the utmost that relationship between teacher and pupil which, while full of mutual instruction, is capable of yielding so much permanent pleasure.

DENTAL EDUCATION.

(Abstract of a Paper read at the fourth annual Reunion of the Dental Societies of the Seventh and Eighth Judicial Districts of the State of New York.)

BY GEORGE T. BARKER, D.D.S., PHILADELPHIA, PA.

It will, I think, be admitted by all, that every one who now enters into the ranks of dental surgery should do so only after careful training and close study. This is demanded not only by the public,—but by the dental profession, and hence this last-named body must adopt such action as will best favor the interest of students,—and promote the advancement of dental education. Although we find established, in many States, dental colleges, it is nevertheless true that none of them receive that encouragement to which they are entitled,—and are not supported with that favor which alone can make them the efficient institutions for instruction which was the aim of their originators. None of them have attained that perfection which they could reach were they differently circumstanced. One serious obstacle in the way of their success has been the multiplicity of charters which have been granted by different legislatures, and as a consequence schools have been established in ill-chosen localities, deficient in experienced teachers, without proper material for illustration of lectures, and able only to support themselves by offering facilities to students for easy graduation, unwarranted by either the capabilities, or interests, of the student or the profession. Many of these colleges, after a few years' struggle, with frequent change of faculty, have passed out of existence; but the evil they have done lives after them, for they have failed to prepare their graduates for the responsibilities of their profession. Then we have seen medical colleges tacking a couple of dental chairs to their faculty, and claiming to be efficient institutions for the education of dental students. The fact must be patent to all that one of the sources of the success of the dental profession, in the past, has been from the teachings of dental colleges, and in the future the greatest good will be accomplished if the facilities of such colleges are enlarged and perfected. But there must be a modification in existing institutions.

Another obstacle deserving especial notice is the permission granted by legislatures to certain district societies to examine applicants, and if found worthy to indorse them by the bestowal of a dental degree. This action, although for a time good men and true may guard the outer door, will eventually be productive of serious injury to our best interests. Let us suppose a case. Two gentlemen of fair average ability are practicing in the same inland city; both well known in the community; one is aware of his deficiencies, and, unwilling to remain in the rear rank, sacrifices for a time his business interests, leaves his practice, goes to a distant city, attends a dental college, studies laboriously, and prepares himself to practice dentistry with honor to himself and his profession. He returns with his diploma, only to find that his rival has during his absence spent two or three days in attendance on some district society, and has obtained a degree which the public recognize as quite equal to the one possessed by the gentleman who has made the sacrifice of time and money for the sake of knowledge. Nay! the public will look upon the possessor of the degree obtained during three days' absence as much the best informed man, for he has only to say, "Dr. So-and-so had to go to a college for months and learn the rudiments, while my ability was recognized by my fellow-practitioners at once, and my indorsement was equally prompt." It may be urged that students will be aware of the superior advantages possessed by colleges for imparting knowledge, and that those institutions which are the most efficient will receive the most support; this is true only to a certain extent, for there is not a dean of a dental college who is not receiving letter after letter with the same burden, viz., how to get the degree with the least expenditure of time and money,—many, indeed, demanding that they be promised a diploma, without fail, at the end of the session. For the honor of our American dental colleges, I believe no institution at present in existence would make such a promise to a student; but it evidences an unhealthy tone among many of those about to enter the ranks of our specialty.

If asked what in my judgment would best advance the interests of dental education, I would answer, reorganize and consolidate the existing dental colleges, establishing as their successors two or three national dental colleges, with faculties selected from the best dental teachers in the land, so situated that they would be convenient to large sections of country, and not liable to react upon each other, with uniform fees for attendance and graduation, and such endowment that the greater portion of the time of the teachers could be devoted to the preparation and delivery of carefully prepared lectures. In this way the best interests of the student and practitioner would be subserved; positions would not be held for honor merely, as is now the case; but the incumbent of a chair would be remunerated for the labor expended. The same sentiment should pervade our profession as prevails in the medical, that every one must enter the profession through the only legitimate and recognized door. If such a feeling was universal, colleges would not as now be compelled to ask one professor to teach dental therapeutics and dental pathology, two entirely distinct subjects; or anatomy and physiology, or operative dentistry and dental pathology, or dental chemistry and materia medica; each chair would have its incumbent, and thus the usefulness of the instruction be enlarged and assured. Only when this feeling universally pervades the dental profession will we find dental practitioners taking the rank, socially and professionally, to which they aspire, and students will catch the impulse from their preceptors, desiring then not so much the degree as the knowledge entitling to it.

Another point worthy of thought is the necessity for a preparatory course for dental students which will fit them more perfectly for entrance as students into dental colleges. In this course should be taught the general branches of anatomy, physiology, and chemistry, with perhaps such other practical branches as experience would determine. By attendance for a session at such a preparatory school, the student would be better fitted to appropriate the material subsequently offered in colleges. I favor, as of the greatest importance to dentistry, dental colleges unhampered by the interests of medical schools or medical teachers; indeed, so important do I consider exclusive dental colleges, that I would have every chair if possible filled by a practical dentist. No general chemist, pathologist, therapeutist, or physiologist, however well informed, can understand the wants of the dentist for these special branches of science; hence much must be taught that is unnecessary to him, however valuable for general information, and much must be left untaught that is requisite for use in professional practice. It is the mission of others to treat of that which is fixed; ours that which is progressive and practical.

In conversation with graduates and students for the past fifteen years, I have found numbers who are aware of and recognize the shortcomings of dental education and dental colleges, and the conviction has been generally expressed that the curriculum of study should be made more practical, more comprehensive and extended, and more in accordance with modern ideas and improvements. If this fact is acknowledged, then it is time the dental profession as a body should take the matter in hand and accomplish the desired result.

PROCEEDINGS OF DENTAL SOCIETIES.

THE PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

The regular monthly meeting of this association was held in the Pennsylvania College of Dental Surgery, on Tuesday evening, November 12th, 1872. Many of the students of the college were present by invitation.

An essay on "The Use of the File" was read by Dr. Amos Wert. After describing his method of filing teeth, which he practiced only when caries was present, he said that while there was much that is practical and valuable in what Dr. Arthur advocates as correct in practice, he objected to his beginning to separate the permanent teeth as soon as they were fully developed, *before* any caries is found on the proximal surfaces, because they will probably decay sooner or later; and more especially to his advising a repetition of the separation as long as the teeth will come together again, on account of the loss of tooth structure. We are careful not to extract the temporary teeth prematurely, in order to avoid a probable contraction of the jaw, and consequent irregularity of the permanent teeth. He thought the same result would follow the early separation of the teeth by the file. He also objected to Dr. Arthur's practice of cutting away a portion of the second temporary molars as soon as the first permanent molars appear; and then cutting away in their turn all the permanent teeth as they appear. At the same time he gave Dr. Arthur all credit for many valuable suggestions contained in his recent work.

In discussing this paper, Prof. James Truman said: This question of filing teeth is perhaps the most important that has claimed our attention for several years. That filing teeth would preserve teeth was a fact well understood at very early periods in the profession; but it is only within a recent period that the practice has been reintroduced and the mode of performing it clearly defined. In the infancy of the profession the file was more relied upon to preserve teeth than any other means. So much was this used by the French operators that an English writer (Berdmore, 1770) deems it necessary to denounce them severely. The process as practiced in this country in the early part of the present century was certainly not one to be imitated, though it effectually preserved the teeth operated upon.

Why does filing preserve the teeth? The solution of this question necessitates an examination of the beginning and cause of caries. We find in all mouths decay presenting itself in certain well-understood positions. So constant is this, that the experienced operator invariably examines these points for diseased tissue. All depressions invite caries; all proximating surfaces; all parts overlaid by soft tissue. The masticating and basilar surfaces, the necks of the teeth, linear depressions, and the overlapped *dentes sapientiæ*, comprise the points attacked as a rule. There must be a reason for this constant action of caries in these positions, and we find the explanation in the deposition of the secretions in all parts capable of retaining them. Whatever views may be held regarding the theories of caries advanced at different periods, there will probably be no exception to this. Whether the fungi theory of Leber and Rottenstein be accepted or not, all must equally agree that it requires but a minute abrasion of the surface to predispose to decay. This may not be apparent to the unassisted vision, but may be equally effectual in its work of destruction. In illustration of this I need but recall to your minds caries progressing in the interior of a tooth without apparent external opening. While this tendency of caries to progress with increased rapidity, after having entered the tubulated dentine, is present at all the points named, it is peculiarly on the proximate surfaces that it presents its most injurious results. In the first named, nothing but carelessness on the part of operator or patient will permit extensive destruction on the other; neither can prevent it entirely, by the usual process of treatment. Upon some of the teeth we may perceive the decay, by certain well-understood signs, and arrest it; but these cannot always be relied on. The operator observes nothing wrong; the patient is allowed to depart, to return probably in a very short time with an extensive fracture, exhibiting unmistakable evidence of long-continued and deep-seated caries.

Therefore do I regard that treatment the best which meets the disease in its incipiency or prevents it altogether. If the approximation of surfaces retain secretions, and deposits of food and secretions and decomposed aliment produce caries, common sense would say separate the teeth. It is upon this plain proposition that Dr. Arthur bases his practice of filing. I say *his*, because I regard him as the originator of the only feasible and unobjectionable mode yet presented. The teeth of children are almost invariably of soft structure. What is to be done? Time is almost certain to exhibit caries, and the earlier it occurs the more rapid will be its progress. Dr. A.'s plan is to cut the deciduous away from the permanent. This is reasonable and effectual. If the permanent anterior teeth are all in place, I would not separate unless there was a strong predisposition to caries, which must be determined by the structure of the teeth and character of secretions. In the bicuspids, and between the first and second molars, there exists always a degree of uncertainty that should be met at once by separation. I have been long an advocate of this operation on these teeth, and regard it as essential to their preservation.

Dr. Wert objects to filing the temporary second molar when the first permanent makes its appearance. The importance of this latter tooth is, in my judgment, very great. It has been too much underestimated. It has been found difficult to save, and for the reasons already given. It therefore becomes doubly our duty to guard it on every side. I cannot appreciate the value of the temporary molar compared with this. I think the great fault with dentists has been that they have been afraid of space. The anxiety to restore the tooth to original form has led many to lose sight of the cause of caries, and thus by their action they have invited the destruction of their own work. If impinging surfaces invite decay, the same result will and does follow the impingement of fillings. It is strange that this practice was ever adopted, and it will be still more strange if intelligent observations do not lead to its entire abandonment.

The idea entertained, that the space required must be so large as to prove a disfigurement, is an error. It is true that a certain amount of tissue is lost, but this need not weaken or disfigure. We want a separation of a form and size that will clear itself or be kept clean by the patient.

That these separations will possibly cause contraction of the jaw, as asserted by Dr. Wert, seems to me wholly unreasonable. This cannot occur without absorption of the bone, and how this is to be produced by this separation is not very clear. Teeth may come together again after separation, but this is by no means, in my experience, a common occurrence.

I would give Dr. Arthur all credit for the innovation on established usages. It required much moral courage and a firm belief in the truth of his position to meet the prejudices prevailing in the profession. It will require time and patience before we can change the same feeling existing in our patients, and here I anticipate will be found our greatest difficulty.

Dr. William H. Trueman. All the arguments advanced in favor of separating before decay apply with more force after it has actually commenced. And here I desire to call attention to the two methods in use for gaining access to proximal cavities on the anterior teeth, and to the absolute necessity of leaving wide, easily cleansed spaces between them. I am astonished to see the little care used to keep the gold out of sight, and more so to find this practice indorsed and commended at the last meeting of the American Dental Association. I have had a severe experience on this point. Some twelve years ago I had six small fillings inserted in my incisors. The teeth were wedged apart, filled, and allowed to close up again. The idea then was to avoid as much as possible all injury to the enamel. In about four years they were dancing around "like peas in a bucket." I admit they might have been brushed more faithfully; but how can teeth be kept clean on the proximal surfaces when crowded together? They were refilled with large V-shaped spaces on the inside, and decay has not appeared since. Two dead teeth, with frequent attacks of periosteal irritation, is the price paid for a lesson I shall never forget.

These two casts from the same mouth I have prepared in illustration of this. In one the teeth are slightly separated, and marked with ink to represent proximal fillings inserted from the front. They are all plainly in sight. The patient could not expose the teeth without the gold being distinctly seen, while the difficulty which has caused these operations still exists, and in nine cases out of ten, sooner or later, will require their renewal. I don't think it is right to thus make our patients' mouths resemble a jeweler's window. I would as soon allow a hatter or tailor to display his card in glaring characters on the front of my hat or back of my coat, as allow a dentist to so conspicuously display *his* in my mouth. In the other the teeth are cut away from the inside, as Dr. Arthur recommends, and as was and is now the practice of many accomplished operators. There is no visible mutilation of the teeth, and the gold is entirely out of sight; examined from the front, it would be difficult indeed to detect that anything had been done to them, and yet they are cut away and marked as though large fillings had been inserted.

This is not all: these wide V-shaped spaces, which *cannot possibly close up*, almost insure cleanliness, and not only give the operator more working room, but also an opportunity to examine them at any time.

This is also illustrated by these cuts from Dr. Arthur's work. Fig. 1 represents the inner, and Fig. 2 the anterior, surface of two centrals cut away and filled from the inside. Fig. 3 shows the opposite practice. Fig. 4 exhibits all of the teeth filed according to Dr. Arthur's recommendation.

FIG. 1.

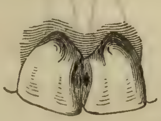


FIG. 2.

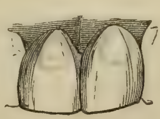
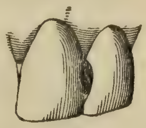


FIG. 3.



The removal of so large a portion of this roll or buttress of enamel, that nature evidently designed to support the cutting edges, I notice by some of the discussions, has been objected to, and attention called to the small loss of substance when we approach from the front.

Fig. 4.

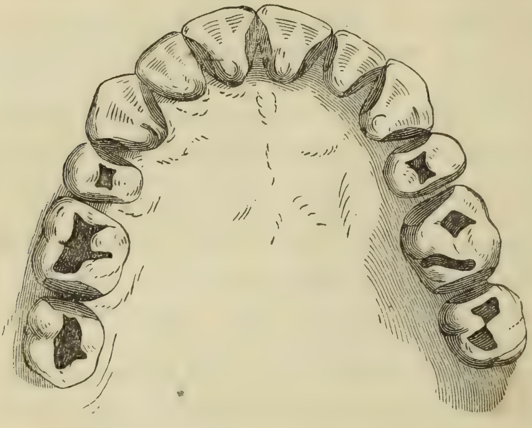
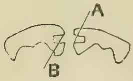


Fig. 5.



In illustration, let Fig. 5 represent a cross section of two central incisors. The palatal depression is well marked, and the pillars on either side unusually distinct. The point of contact is not at the center of the proximal surface, but nearer the front, and, in consequence, the labial wall is the thinnest but not therefore the weakest. As the decay advances, it approaches the palatal depression, and leaves an almost isolated pillar of enamel, liable to splinter off if subjected to pressure. The cavity is much easier approached, and with far less loss of tissue, as at A ; but the operation is unsightly, and, unless the teeth are very much mutilated, is difficult to keep clean, and equally difficult for future examination. If the space is made as at B, we preserve the stronger at the expense of the weaker wall. The operation is entirely out of sight, easily cleansed, and readily examined. Admit that all the objections to the removal of this support to the angle of the incisors are well founded, is it not better to choose the lesser evil while we can, and remove a portion to *prevent* decay, rather than wait until its ravages destroy it entirely ?

Dr. J. H. Githens. The free use of the file is much better than filling, if the cavities are very shallow. I have found filing the teeth to preserve them from decay ten or twenty years, but have never used the file unless there was caries present. The V-shape is the best.

Dr. A. Wert. I have been here when filing was looked upon by the members of this association as malpractice when carried to a slight extent only. I advocate filing the teeth, but not indiscriminately. Prof. Truman says he does not know that the jaws contract. I think it is generally acknowledged that, if the temporary teeth are extracted prematurely, the jaws will not expand, if they do not contract. Dr. Arthur says the teeth will change their position frequently, so that they must be examined at least once a month, and you must continue to separate them as long as they will come together. This constant filing would take away too much of the tooth structure. This is my only objection to his method.

Prof. Truman. I believe in the fullest and freest examination of any subject. Dr. W. H. Trueman's models exhibit the importance of freely canvassing views, no matter by whom promulgated. I was astonished at the remarks of the prominent gentleman who advocated, at the American Dental Association, the filling of teeth from the labial surface. It seemed to me like going back to early periods, and to a practice supposed to be long since abandoned. In my judgment, the skill of the operator is best evidenced by keeping his gold out of sight as much as possible ; and this can only be accomplished by securing ample space and filling from the palatine surface.

I do no believe the jaws perceptibly contract by filing the teeth. There may be a slight torsion of the teeth, but it is not usual for them to come together. Dr. Arthur's cases, where repeated filing was necessary, were and are exceptional.

Dr. J. H. Githens. If a bicuspid tooth is extracted from each side, do not the teeth come together ?

Prof. Truman. Under certain conditions the tendency is to approach each other. If spaces exist posteriorly, this tendency does not exist. The natural direction of all teeth is *from* the center and not towards it. If spaces are made between all the teeth, this forcing process will be overcome.

Mr. Mansfield. I have read in reference to Dr. Arthur's practice, and do not favor it. If a tooth is decayed, we should go upon the principle of saving as much of the sound tissue as possible. If the back part of a tooth is removed by filing, the front part will be fractured by use.

Professor Truman. If a cavity on the proximal surface of a tooth should be filled and built out to the original form, the gold would be in contact with the adjoining tooth, and thus there would be a place for the deposition of secretions. This would result in the breaking down of the enamel of that surface. If there are cavities on both sides, and the gold is in contact, the danger is not so great, but yet the edges of the cavity are near together, and discoloration would occur there. The action of the secretions upon the teeth renders it impossible to hold the teeth together without caries resulting. The only reason it does not occur in all teeth is, that the alkaline secretions neutralize the acid. I would not separate children's teeth if no decay be present, unless there is a strong tendency to it, as shown by the character of the teeth.

Mr. Newman. There is among dentists a fear of sacrificing too much of the sound tissue. This is due to the misuse of the file in early times. Now we do not sacrifice enough, as, when there is a cavity on the proximal surface of a tooth and another on the grinding surface, they are frequently filled as two cavities, instead of cutting away and filling them as one. This same fear of destroying sound tissue causes the objections to Dr. Arthur's method.

Adjourned.

E. R. Pettit, *Secretary.*

CONNECTICUT VALLEY DENTAL ASSOCIATION.

At the tenth annual meeting of this society the following were elected officers for the ensuing year:

President.—Dr. J. Searle Hurlbut.

First Vice-President.—Dr. E. S. Davenport.

Second Vice-President.—Dr. H. M. Miller.

Secretary.—Dr. L. C. Taylor.

Treasurer.—Dr. E. M. Goodrich.

Executive Committee.—Dr. F. Searle, Prof. L. D. Shepard, Dr. J. F. Adams.

President Riggs's retiring address was upon the subject of "General Dentistry."

"The Use and Abuse of the Mallet" was taken up, and a general expression of opinion obtained. Dr. Searle strongly advocated conservative practice, believing that patients prefer hand-pressure. Dr. Harwood thought the abuse of the mallet had almost done away with its use. Dr. Clapp uses the mallet and hand-pressure both, believing the judicious use of the two forces will produce better results than can be obtained by the exclusive use of either. Dr. E. S. Davenport claimed to have replaced many fillings, securing good results with the mallet where he had failed with hand-pressure.

"The Wedge, the File, and the Chisel" were discussed, each having their advocates. The latter, it was claimed, possesses many advantages, when used according to Dr. Arthur's theory.

"Mack's Retaining Screws" were strongly recommended by Drs. Mills and Shepard, who believe them to be indispensable in many difficult cases.

"Comparative Success with other Materials than Vulcanite as a Base for Artificial Teeth" was discussed. Several specimens of celluloid and coralline were presented; and the opinion was advanced that the further perfection of one or both materials would produce a base with qualities superior to rubber.

The subject of "Regulating Teeth" was introduced, with an essay, by L. C. Taylor, on "Special Orthodontia."

Dr. Riggs presented casts, representing the mouth of a young lady, sixteen years of age, recently treated by him, where the six-year molars were extracted, to gain room to carry all the anterior teeth back, at the same time spreading them sufficiently to admit the two centrals to drop into the regular arch, thereby depressing them more than one-half their diameters.

Prof. Shepard also presented casts, with very interesting remarks, claiming that the law of forces must be thoroughly understood before difficult cases can be treated successfully. He condemned the practice of extracting the cuspids, especially where the six-year molars have been previously removed, as was shown by casts presented, which leave the patient with a deformed expression for life.

Adjourned to meet at Worcester, June, 1873.

L. C. TAYLOR, *Secretary.*

EAST TENNESSEE DENTAL ASSOCIATION.

THE Sixth Annual Meeting of the East Tennessee Dental Association convened at Knoxville, Tennessee, September 17th; President Dr. W. H. Cooke in the Chair.

The annual address was delivered by Dr. A. J. Dunn.

Dr. Cooke read an interesting essay on "Chemistry;" Dr. Prothro, one on "Theory and Practice of Dentistry;" Dr. Fowler, one on the "Purification of the Blood;" Dr. Mayes, one on "Mechanical Dentistry."

The essays were ably discussed.

The "Proper Method of Cleansing Teeth," "Filling Teeth," "Wedging," "Mechanical Dentistry," the "Normal and Abnormal Condition of the Saliva," etc., were subjects of debate also. Clinics were held daily by Drs. Fouché and Cooke.

New members were added both from Georgia and Tennessee.

The following officers were elected for the ensuing year:

President.—Dr. W. H. Cooke, of Cleveland.

Vice-President.—Dr. A. J. Dunn, of Bristol.

Corresponding Secretary.—Dr. W. F. Fowler, of Greenville.

Recording Secretary.—Dr. Prothro, of Chattanooga.

A special meeting was appointed to be held at Chattanooga, Tennessee, in April, 1873.

W. F. FOWLER, *Corresponding Secretary.*

CLINICAL REPORTS.

UNIVERSITY OF PENNSYLVANIA.

SERVICE OF JAMES E. GARRETSON, M.D.,
LECTURER ON SURGICAL DISEASES OF THE MOUTH.

REPORTED BY DE FOREST WILLARD, M.D.

FRACTURES OF INFERIOR MAXILLA.

GENTLEMEN,—The cases which I present to your notice this morning will illustrate two varieties of solution in the continuity of the fibers of the maxillary bone. The first case is that of a young man who received, last night, a full blow from the fist of an antagonist. He fell to the ground, and upon rising, discovered that a severe injury had resulted to his jaw. Cold water alone has been applied, so that you now see the case with all its primary symptoms. . What are they? Pain upon motion, swelling, loss of power, preternatural mobility, irregularity of the dental arch, and lastly, a peculiar rough sensation imparted to my fingers when I press upon the parts, which is known as crepitation. These symptoms, taken collectively, afford abundant proof that a fracture of the bone has occurred,—they could not co-exist in any other condition. Examining more closely, I find that the line of fracture is between the first and second bicuspid teeth, and that the posterior fragment lies somewhat above and in front of the anterior; a fact easily explained by the action of the masseter and genio-hyoid and digastric muscles. Were the break farther back, beneath the attachment of the masseter, the displacement would not be great, while if the neck of the condyloid process were knocked off, the whole body and ramus would be dragged far forward by the action of the pterygoids.

The seat of fracture in a jaw will depend both upon the direction and character of the applied force and the condition of the dental arch. The most common lesion is about upon the line of the canine teeth; but if teeth have been removed, and the alveolar processes absorbed, then such narrowed portion becomes the weakest point, and would most probably give way before the blow, especially if the force were diffused from the point of the chin. When the blow is received upon one side, and is severe in its character, then the lesion will most probably occur at the seat of application. In many cases of kicks from animals, or the passage of heavy vehicles, several breaks may occur simultaneously, which are frequently of the compound or comminuted variety.

Even when the blow has been but moderate, a compound fracture, opening upon the lingual aspect, is quite common, the gum tissue tearing to such extent as to permit the entrance of both air and saliva. The existence of such a wound is sometimes quite injurious to the process of repair on account of the entrance of the saliva, and subsequent caries or non-union occasionally follow; but I have observed several cases in which there was no recognizable interference.

Another cause of fracture, which is not unfrequent, is the extraction of teeth with curved roots. In these cases the lesion is usually confined to the alveolar process, yet breaks have occurred through the entire body of the bone, and been followed by caries or necrosis, as those of you who have attended this clinic for the past year have had opportunity for verification.

In fractures situated near the symphysis the direction of the break is nearly always transverse; in the ramus the oblique variety is more common.

The process of repair of this bone differs somewhat from that ordinarily observed in other bones, in the fact that there is but little, if any, ensheathing callus. The vessels of the bone pour forth a uniting material, which ultimately undergoes ossification, and gives a strong and tolerably perfect cure.

In ordinary fracture of the long bones, nature, as you know, forms a splint by the production of this "provisional or ensheathing callus" to which I have alluded. With its method of formation I suppose you are all familiar; yet it is so interesting a process of nature that we cannot too often review it.

In all cases of fracture there must be a certain amount of hemorrhage from the lacerated blood-vessels of the bone itself, which, extravasating, soon works its way into the cancellous structure, under the periosteum, into the medullary canal, into the connective tissue around the ends of the bone, and, if profuse, insinuates itself between the muscles, and is seen beneath the skin several days subsequently as "suggillation." This blood, not being exposed to the air, remains in an uncoagulated condition, and in a few days, acting as a foreign body, sets up an inflammatory action, which is accompanied by all the phenomena of that complex act, *i.e.* heat, swelling, transmigration of leucocytes, or white blood corpuscles, etc. Organization now commences, and the exudate soon becomes more consistent, holding the bones in position both by the "pin" within the medullary and cancellous cavities and the encircling "ferule."

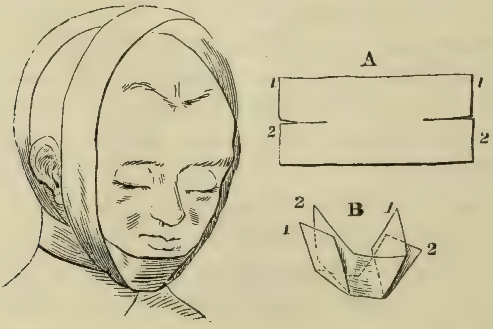
This organized material is the provisional or temporary callus, and consists of spongy bone-substance, which is usually firm enough to be capable of function. But this callus does not remain stationary. A change soon commences, that of ossification, and this is continued through a series of months, or even years. The soft bony substance which was found in the medullary cavity is reabsorbed, the excess of circumferential tissue is likewise carried away, angles are rounded, and new bone forms between the fractured cortical layers, which becomes solid by the time that the external and internal callus have disappeared. Such is the process in ordinary long bones. In flat or spongy bones the process differs only in the small amount of provisional callus. In cranial bones it may be said to be entirely absent.

Upon the amount of this material will depend largely the subsequent deformity, and as motion is the factor which enters largely into the production of callus, our first indication in treatment should be to secure immobility; more properly speaking, however, that is the second indication, the first being to coaptate the parts and bring them as nearly as possible into their former relations. This can be accomplished in the case before us by bringing up the anterior or symphysial fragment with the fingers while the thumbs are firmly pressed upon the bicuspid and molar teeth. The line of the dental arch will be the guide as to when a proper replacement has been secured.

Having thus "set" the fracture, we proceed to dress it. The only requisites are a piece of pasteboard or gutta-percha, some cotton, and a roller. The size of the splint will depend upon the seat of the fracture, the rule being to permit the splint to project beyond the point of lesion.

The binder's board is easily softened with hot water, and if incisions have been previously made in the ends of the strip, no difficulty will be experienced in turning the ends and moulding them into such an accurate adjustment that no one point will be injuriously pressed upon when drying has occurred. (See Fig. 1, A and B.)

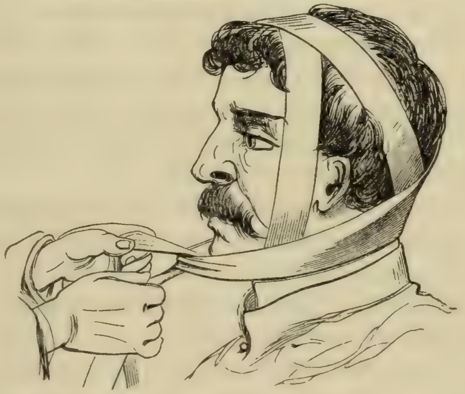
Fig. 1. Barton's Bandage.



A. Shape of the piece of gutta-percha for the chin. B. The same moulded to the part, —the ends, 1, 1, being turned upward, and the sides, 2, 2, turned from before backward.

A cup or box is thus formed, which when padded with the cotton is to be firmly held in position by a bandage which shall press the chin both upward and backward. This may be accomplished by the Barton or Gibson bandage, with which you are so familiar. I have found a modification of these dressings to answer every purpose, while at the same time it is more convenient in its application and removal. I take a strip of muslin one and a half yards long and two inches wide. Standing behind the patient, I rest the chin upon the center of this strip, then bring up the ends, cross them above the forehead, carry around the sides of the cranium, crossing again at the occiput, whence passing forward, they are tied or pinned in front of the chin or upon the side of the neck. (See Fig. 2.)

FIG. 2. GARRETSON'S BANDAGE.



If this patient were a lady with a profusion of hair, the Barton bandage could be supplemented by one or two circular occipito-frontal turns, which when pinned at the intersections effectually prevent any tendency to slipping. The simple sling of four tails is often used, but will not retain its position when the patient lies down. Hamilton's sling is good, but is not often of ready access. Wiring the teeth in fracture has been frequently practiced, but is, I believe, seldom necessary, and is sometimes positively harmful. When apposition cannot be maintained by the ordinary dressings, I prefer the use of plates or of interdental splints.

Interdental splints consist of two plates, one to fit the upper teeth and roof of the mouth, the other to cover in a number of teeth upon each side of the fracture. The impressions for these plates are taken precisely in the same manner as for the ordinary artificial sets of teeth. These plates are placed in position after the coaptation of parts, and temporarily united together by means of wax; then removed and soldered together. This done, the teeth are firmly closed upon them, fitting each into its own little cup or socket, and as soon as the bandage is applied the dressing is complete. The mouth is necessarily kept partially open; in many cases the dressing makes an excellent one, and is not easily displaced.

Interdental splints will be more fully described at some future time, as cases of ununited or complicated fractures shall present themselves, at which time I shall speak to you of ingenious forms of apparatus devised and used by various surgeons.

I shall dress the case before you with the binder's-board box and modified bandage, which I have shown you. This dressing is to be continued for four or five weeks, during which time mastication must be interdicted, and liquid nourishment alone administered.

When teeth are loosened or even entirely displaced, they should be carefully readjusted in their sockets, since there is a strong probability that they will contract adhesions and become firmly fixed, especially if the plates of which I have spoken are used. Any missing teeth should be searched for, since they might be driven down between the fragments, and thus prevent union. However, this would seldom occur, except in cases of compound fracture, and it is our intention to-day to deal only with simple breaks.

In cases where a fracture is double and the tendency to displacement great, Lonsdale's or Mütter's clasps may be used. Velpeau was in the habit of leaving these fractures untouched, believing that the pain consequent upon motion was sufficient to compel the necessary quietude upon the part of the patient.

Our second case is an obscure one. The man now shown received a blow upon the side of his face some five days since. He has since been suffering with severe, constant, and deep-seated pain in the temporo-maxillary fossa, together with loss of power in the movements of the lower jaw. I can discover in this case no crepitation, and but little displacement, although there is a slight depression below the zygoma, and a corresponding elevation observable through the mouth.

I think that all the circumstances of the case justify us in pronouncing this to be a fracture of the neck of the bone. If this fracture is near the condyle it is beyond our reach, and we can do nothing more than keep the parts at rest. To secure such quiet, we fold a thick compress, about three by two inches, and then adapt it to the part in such a manner as will best fulfill the indications. A good retaining bandage is that known as the "crossed of the angle of the jaw." Three circular turns of the head, then three vertico-maxillary turns passing over the seat of the fracture, and then behind the ear of the opposite side, finishing with one or two circular fronto-occipital turns. This will keep the jaw at rest, and will but seldom require removal. A Barton bandage, or the modification suggested, will also be found sometimes advantageous.

In many of these cases of fractures of portions of the ramus, I believe that no better treatment can be devised than the simple binding of the lower jaw to the upper one, thus making the interlocking teeth the points of support.

* * * * * *

[Both patients recovered with good union, and without perceptible deformity.—De F. W.]

EDITORIAL.

THE ELEVATION OF THE PROFESSION.

This phrase, so often in the mouths of both medical and dental practitioners as to have become almost distasteful, expresses nevertheless the legitimate desire of every honest member of either profession.

It is not difficult to understand that the qualified and conscientious practitioner chafes at the association of his name with those of charlatans; at finding his calling belittled and disgraced by the assumptions of ignorant pretenders; and at the want of appreciation on the part of the public which fails to discriminate between them.

However individual members of the profession may fret at this condition of things, it is apparent that the fault is not alone with the community. The advance of dentistry from empiricism to a systematic art has been so rapid that only the exceptionally studious of its early membership have kept pace with its growth. Almost within the memory of its youngest practitioner it was a trade, and hundreds now practicing it selected it as a vocation because of the conviction that it offered an opportunity for the exercise of the mechanical skill of which they felt themselves possessed. Of these, some have perceived the fact that culture and progress were essential, and have grown with the growth of the profession, and to-day stand shoulder to shoulder with those whose opportunities have far exceeded their own; but too many, alas, failing to perceive the evolution in progress, have rested in their mechanical skill, and are left behind in the onward march.

All credit to the men who, without the advantages of a systematic training, have, by industry and perseverance, conquered a position of honorable distinction. Of these, perhaps no word can be said more to their credit than that, recognizing as they only could the deficiencies of their associates, they have chosen rather to suffer reproach by reason of association with the less deserving, than to abandon the profession of their choice to the control of the unworthy.

From such motives there are to-day, in the ranks of the dental profession, men whose qualifications would insure them quick promotion in general medicine or surgery, but who, faithful to their first love, count it their highest ambition to elevate the profession they have adopted, and compel recognition of its value as a specialty of medicine. They are certainly entitled to honor and esteem who, entering the profession under such adverse circumstances as belonged to its early history, before a rational and scientific basis had been attained, have kept step with modern investigation, and in spite of the odds against them, have lifted not only themselves, but the profession they represent, into recognition and position by virtue of their intrinsic merit.

In every profession there will be some who are as much superior to the average as others are below it; but the average will, after all, determine its status as a profession. So, if required to furnish a formula by which the profession could be elevated, the prescription would be, that as victories are gained where every soldier carries one musket, and makes good use of it, so let every dentist see to it that he furnishes one good member of the profession, and the result would be secured.

The ranks of all professions are recruited by those who are emphatically self-made men, who, without the aid of universities or preceptors, have not merely made themselves respectably proficient in their calling, but have risen to eminence and fame as authors and teachers. These, however, are the exceptional men, gifted with more than ordinary insight and energy. The vast majority need all the helps attainable to qualify them for successful practice.

The necessities for a higher professional standard are increasing yearly, and can only be met by a more thorough educational training. The field is widening, and as more and more each year representative men gravitate to dentistry as a pursuit, so more and more will the community appreciate their worth and comprehend the difference between the educated and uneducated practitioner.

It will not long answer that a dentist be merely an expert operator; he must understand the structure and functions of the parts with which he deals, their regional and systemic relations, their pathological liabilities, the causes of aberration, and the means and methods of restoring abnormal to healthy conditions. He must comprehend diathesis, temperament, hereditary tendency; the influence of habits and occupations; the local sequences of disease and medication—in a word, he must comprehend the anatomy, histology, physiology and pathology of every tissue of the mouth as thoroughly as the scientific ophthalmic surgeon comprehends the tissues with which his specialty is concerned. More than this, he must be grounded in general principles; must be familiar with anatomy, embryology, physiology, chemistry, materia medica, surgery, and the practice of medicine.

If such knowledge be considered superfluous, how else, we ask, can it be expected that the practititioner can appreciate the nature of the changes in structure and function which are called disease, or the conditions which hinder or promote normal processes and results?

If the profession of dentistry is to be restricted to mere mechanical manipulation, much of this training may be dispensed with; but, if it claim recognition and position as a specialty of medicine, it must keep abreast of its sister specialties in order to deserve or receive the respect and confidence of the medical fraternity or answer the expectations of the community.

TRAFFIC IN DIPLOMAS.

The following letter, with an accompanying circular, has been sent us by a Parisian dentist, by whom it was received. We give the enterprising dealer in degrees the benefit of a wider circulation of his overtures than he could probably otherwise secure. Need we say to our European friends that they have no occasion to be concerned from the fear that their honestly-obtained diplomas will be lessened in value by the indiscriminate sale of such shallow frauds? Whoever invests in this enterprise deserves to lose not only his money, but the respect of the community. We predict that, in a short time, the holders of these diplomas will be more anxious to conceal than to display them. Degrees worth possessing cannot be bought in America any more readily than they can in Europe.

[Translation.]

Jersey, England, October 30th, 1872.

Sir,—As in your profession it ought to be very useful and advantageous to you to have the title of Doctor in Dental Surgery, and to possess the diploma thereto belonging, I have the honor to inform you that I have it in my power to have you dignified as such by the American University of Philadelphia, whose rules and regulations I remit you. I undertake all the formalities at my expenses, risks, and perils; thus you will obtain your diploma without inconveniencing yourself. The total sum of expenses will amount to six hundred francs; after that there will be nothing more to pay. I am at your service to be useful and agreeable to you, and I pray you to accept my most sincere regards.

P. F. A. Van der Vyver,
46 Rue du Roi (*i.e.* 46 King Street.)

PUBLISHER'S NOTICE.

THE NEW VOLUME.

The present number introduces the Fifteenth Volume of the Dental Cosmos. Succeeding numbers will be issued on the first of each month during the year. We have sent bills to those whose subscriptions expired with the last number, and request such as contemplate renewing, or those who intend becoming subscribers, to send in their orders promptly, so that we may determine the number of copies to print, and that those who desire may be certain of securing complete files of the journal. We shall adhere to the system of CASH PAYMENT IN ADVANCE.

We most earnestly desire to make the Dental Cosmos the best dental journal in the world; the most efficient in the promotion of the best interests of the specialty of dentistry; and to this end we cordially invite the co-operation of the profession.

The editorship of the journal will continue under the supervision of Dr. J. W. White.

SAMUEL S. WHITE.

PERISCOPE.

What will Make Good Teeth ?—It is an old and common saying that bread is the staff of life. The maxim must have originated many generations back, when bolting-mills were unknown and sieves but little used, when bread was made with all the ingredients of the grain included. Such bread is the staff of life. The bread of our time is, most of it, the handmaid of disease. If there is in it any staff, it is weak and brittle, which will soon let a man down. Wheat more than any other grain, perhaps, contains all the elements needful for the nutrition of the system. To have this effect, however, all its properties must enter the bread made of it; none must be bolted or sifted out, nor must the stone grind it too fine. . . . . . It is our duty to be instructors to the heads of families who, with their children, are our patients, in relation to the matters herein treated. When we discover children's teeth defective and decaying we ought most earnestly to exhibit both the cause and the remedy, and urge instant and continued attention to our counsels and instructions. We are bound to recommend the use of proper food, such as oatmeal, barley, unbolted wheat, peas, beans, and beefsteak, and other food designed to make strong bone, good teeth, and healthy bodies.—*Dr. George B. Harriman, in Dental Register.*

Salivation in the Insane.—Dr. Stark communicates a paper on this subject to the *Annales Médico-Psychologiques.* He distinguishes two forms of salivation in the insane, namely, watery flowing salivation and the viscous threading salivation. Founding his argument on the physiological reasoning of Claude Bernard, he ascribes the first variety to the action of the trigeminal and facial nerves, and the second to that of the sympathetic. Thus, in cases of hypersecretion, the saliva of an insane patient being given, it is possible to deduce from it the point of the nervous system which is pathologically affected.

He instances three cases to corroborate this statement.

1. A woman, the subject of intermittent mania. The attack was generally preceded by neuralgia of the trigeminal. Sometimes there was nymphomania, and then the saliva, which is very abundant, was viscid and stringy, without mixture of air (onanism, genital irritation, excitation of sympathetic system). Sometimes there was simple mania, and then the saliva was watery and frothy; and on these occasions, in spite of the furious raving, there could be clearly distinguished an exacerbation of the trigeminal neuralgia.

Case 2.—A young girl suffering from mania with salivation. The saliva had the character of that which is secreted under the influence of the sympathetic; it was viscid and stringy. The attack subsided on the appearance of menstruation, and the salivation also ceased. The patient related that during the seizure she had imagined herself in a brothel, engaged in defending herself against some one who had a design upon her virtue. Evidently here there was implication of the sympathetic system due to irritation of the genital organs, and hence the salivation.

Case 3.—A man died after presenting symptoms of acute delirium with profuse salivation. The autopsy displayed, among other things, an exostosis at the base of the skull, pressing upon the left trigeminal and facial nerves at their point of exit from the cranium.—*Monthly Review of Dental Surgery.*

Disease of the Maxillary Sinus.—Dr. Willrich relates the case of a man, forty-five years of age, who for some eighteen months had suffered from a projection outwards of the left side of the nose, and a frequent discharge from the nostril of masses of a cheese-like appearance, exhaling a very fetid odor. The diagnosis in the case was carcinoma of the septum narium. In preparation for an operation, the left side of the nose was split open, when it was discovered that the entire disease consisted in a distension of the thin shell of bone covering the left sinus by an accumulation within the latter of thickened pus, and the pressing the outer parietes against, and pushing outwards the left side of the nose, without the presence of any apparent alteration in the parts. The escape of the thickened pus was soon followed by entire healing. A similar case was in 1855 recorded by Maisonneuve.—*Deutsche Zeitschr. f. Chirurg.*

Tumor of Jaw.—Dr. Little exhibited a tumor of the lower jaw, for which the entire half of the inferior maxilla was removed by operation the day before at St. Luke's Hospital. The patient was a lady sixty-three years of age, who came under his observation a year ago, with a tumor the size of a small walnut, involving the central portion of the body of the lower jaw on the right side. This had been growing very slowly for the previous four years. On examination the growth was springy to the touch, and crackled under the finger. As it was growing very slowly, and there was but little deformity, she was advised to wait until the symptoms became urgent enough to warrant operative interference.

About two weeks ago she again presented herself, with the statement that for the six months previous the tumor had been growing very rapidly. It was then found to involve the greater portion of the lower jaw, and to encroach considerably upon the cavity of the mouth.

On consultation it was deemed advisable to remove the growth, which was accordingly done. An incision was made from a little beyond the ear, along the inferior border of right half of the jaw as far as the symphysis menti. The bone being exposed, the first incisor was removed, and a section made at that point with the chain saw. This being done, this portion of the bone was seized and its internal attachments separated principally with the aid of the finger until the coronoid process was reached, when its anterior attachments had to be divided by the knife. After a further separation of the attachments by the finger, the bone was disarticulated by a slight twist. The patient, up to the time of reporting the case, was doing well.

The precaution was of course taken, as soon as it was decided to divide the attachments to the chin, of securing the tongue.

The tumor had not yet been examined; but a full report of its microscopical character was promised.—*Report New York Pathological Society, in Medical Record.*

Neuralgia of the Fifth Pair of Nerves, First and Second Branches,—in the case of a lady who could not take morphia, and to whom electricity gave no permanent benefit, was treated by Dr. Winternitz, under the direction of Dr. Dickovski, in the following manner. The patient retained some powerful stimulant (dilute alcohol, one part alcohol, three parts water) a considerable time in the mouth. At the same time, the entire surface of the affected side of the face was evenly rubbed and pressed with a piece of smooth-cut ice for about five or six minutes. (The alcohol in the mouth rendered it less sensitive to the cold.) This manipulation was repeated every five or six minutes during the first two hours. After twelve hours the pain had entirely disappeared, and has not since (ten months ago) returned.—*Wien. Med. Wochenschr.*

TEST FOR NEURALGIA DEPENDENT ON DISEASED TEETH.—A very good test, whether a neuralgia is or is not dependent on dental mischief deeply hidden, is to direct the patient, when the paroxysm is on, to take in his mouth and bring slowly in contact with the teeth, iced water. As the cold is first felt, the pain may or may not be increased, but after a time, as the benumbing effect of the cold tells on the tooth, the neuralgic pain, if the cause of it be local, will certainly be relieved for a period, and such relief is the clearest indication of the seat of the disease.—*Dr. B. W. Richardson.*

A CASE OF REPLANTATION OF A TOOTH.—Mr. Steele stated, in reference to the paper read at a previous meeting of the Society on Implantation, by Mr. Coleman, that he had (on the 23d December last) an upper left canine of his own extracted by Mr. Rymer with great care, there being only slight laceration of the gum and no straining of the process. The tooth was in an exquisitely sensitive condition, from the exposure of the pulp, to the slightest thermal changes. On the extraction of the tooth under the influence of the nitrous oxide gas, the dental canal was cleansed, caries removed from the crown, stopped in the usual way, and the tooth at once replaced in the socket, the operation lasting about half an hour; for three or four hours there was a dull aching pain, after which time it gradually lessened, until on the following day pain had entirely ceased. It was, however, still very painful on concussion with the antagonizing tooth. At the expiration of a week this unpleasant symptom had much decreased, and in less than a fortnight it was capable of fulfilling all the functions for which it was intended. There had been no suppuration, and very slight inflammation. Had there been disease at the periosteum, he would have adopted Mr. Coleman's plan, and removed the affected part, but the root was perfectly healthy.—*Proceedings Odontological Society of Great Britain, in British Jour. of Dental Science.*

SPONTANEOUS DISLOCATION OF THE JAW FROM TONGUE-SUCKING.—On Thursday, August 15th, at midnight, a young lady aged fifteen, a patient of mine, while on a visit at a friend's house, was awakened from her sleep with pain under the ears and inability to close the jaws or to articulate plainly. She aroused her friends, who, feeling alarmed, sent for their medical attendant, who arrived about three in the morning, when he at once declared the jaw to be dislocated, and quickly reduced it. I went to see her on the Saturday following, and found her well, but much alarmed at going to bed, fearing that the accident would again occur during sleep.

I am anxious to place on record this remarkable case, inasmuch as I am persuaded that the habit of tongue-sucking, which the young lady has always done from her infancy, and so audibly during sleep as to be heard in any part of the sleeping-room, was the true cause of this distressing accident. The action of the pterygoid muscles (which are inserted, the one "into the inner surface of the angle and ramus of the jaw as high as the dental foramen," the other "into the neck of the lower jaw and into the interarticular fibro-cartilage") together brings the jaw downwards and forwards, projecting the lower teeth beyond the upper. The continual action of the above muscles during sleep, I have no doubt, had so preternaturally loosened the ligaments and muscular structures supporting the joint, as to render them unable to resist the violent action of them during sleep.—*British Med. Journal.*

Lancing of the Gums.—In former times, and also at the present day, many diseases of childhood have been attributed to dentition. It is especially the want of familiarity with diseases of children which is the cause of this opinion, too generally diffused, even among physicians. The child is subject, from its birth, to various diseases observed at all ages. It may be attacked with a number of these during first dentition, and we should be able to recognize them. The irregularity of the process of dentition may nevertheless interfere with the development; they may be cut either too rapidly or too slowly.

By the eruption of the first teeth, which do not appear for several months after birth, we at first notice ptyalism a long time before the tooth makes its exit from the alveolus. This flow of saliva is a salutary phenomenon; it prepares and renders supple the tissue of the gums. The salivary glands become engorged, and there is a peculiar sensation which leads the child and the young animal to bite the substance which it seizes. This pressure of the gum is useful, and consequently favorable for promoting the separation which occurs between the two layers of bone to gradually open the alveolus. At this period corals are useful, but somewhat later, when the gums become sensitive and the point of the tooth commences to press on the swollen tissue, it is much better to give children, instead of hard substances, marshmallow or liquorice roots—in a word, bodies easy to soften with the saliva. Children frequently accomplish their first dentition without having any bad symptoms, but sometimes the tissue of the gum becomes tense and swollen; there is even thirst, fever, and redness of the cheeks. This is the fever of dentition. At this period we must pay careful attention to the child, and learn if these symptoms positively depend on swelling of the gums alone or on any other disease, such as aphthæ, diphtheritic affections, or convulsions, which may manifest themselves under the influence of dentition, as a result of the congestion which this process may develop in that region of the head.

We should at first employ in these cases only emollients, fomentations over the gums with the finger impregnated with a soothing solution, borax, honey of roses, etc.; slight derivatives acting through the intestinal canal; pediluvia, the use of wadding boots covered with isinglass plaster, secured by tapes to the legs, to prolong a heat which produces transpiration in the lower extremities. When these simple means, which most frequently succeed, fail, we may sometimes resort to incision of the gum, which appears red and distended by pressure of the tooth. This little operation is especially indicated if convulsions are produced by the pain.

To perform this operation, it is necessary that an assistant shall hold the child's head firmly; the operator then separates its cheek with a finger of his left hand, holding in his right a bistoury, the blade of which is wrapped in linen in two-thirds of its extent, in such a way that the point is only uncovered for rather less than half an inch. At first one incision should be made transversely, then another, which will produce a crucial incision. It is still better to remove at a single cut a flap of the gum, without making any previous incision. The swelling is more easily reduced in this way, with the advantage of not having the wound close up on the very next day. We should introduce the extremity of the finger into the wound, to assure ourselves if we can detect the tooth, and if the alveolus is not too tightly pressed, and does not require an incision, which can be readily done with scissors. We must not too frequently perform this operation, which, however, is a harmless one; we must particularly reserve it for the molar teeth, the tubercles of which oppose more resistance to the tissue of the gums. We must also urge the importance of relaxant and calming agents before deciding to operate. We have obtained successful results, but we have observed that by making the incision too soon we may have sometimes retarded the escape of the tooth, because we may open the dental capsule before the tooth has reached its degree of perfect ossification; it then makes its appearance very slowly. It is often then more prudent to refrain from it.—*Guersant on Surgical Diseases of Infants; Medical News and Library.*

Chlorate of Potassa as a Remedy.—Chlorate of potassa, we think, has a specific action on mucous membranes, the glandular and cutaneous systems. In diseases of the mouth and throat, whether inflammatory or ulcerative, chlorate of potassa has a salutary effect. When administered at short intervals for twenty-four hours the inflammation diminishes, as will be seen by the paler hue of the surface, less vascular turgescence, and diminished sensation. If ulcerative, the ulcers assume a healthy action and the fetor is removed. In diphtheria it is one of the most reliable remedies for the lesion in the throat. In no disease is its alterative action better shown. Give to an adult tablespoonful doses of the saturated solution every hour for twenty-four hours, and there will be a marked change in the general appearance of the diseased parts. The exudation will be diminished, the fetor removed, surface paler, the swelling diminished, the vascular action less, the sensation ameliorated, the skin becomes cool, the pulse less frequent; in fact a large per centage of the incipient form of diphtheria requires no other remedy. This may seem a very strong assertion, but from my experience in the treatment of this disease in a severe epidemic, which prevailed in 1864, in the central portion of New Hampshire, an epidemic which assumed all of the forms, from a mild sore throat to the most malignant, sometimes overpowering the system in a few hours or laying the patient prostrate from loss of nerve power, I found no remedy that served me as well as did the chlorate of potassa, given either alone, or, when required, in connection with other remedies. When it has failed I have not thought it a fault of the remedy, but that I did not administer it early, or was not persistent, or my dose too small. In scarlatina anginosa, as well as in diphtheria, the administration of the chlorate will be found beneficial, given either alone or in connection with other remedies. Not only in idiopathic diseases affecting the mouth and pharynx do we see its beneficial results, but also in syphilitic affections of those parts. We find in Braithwaite's Retrospect a report of a case of chronic syphilitic ulcers on the leg of long standing, which had resisted the influence of all the remedies usually employed, but yielded readily to the chlorate of potassa. A case of rupia syphilitica which fell into my hands, after being treated by several professional men of more eminence than myself, yielded to the administration of chlorate of potassa with tonics, and the application of stimulating ointments.—*Dr. L. P. Dodge; Trans. Minn. State Med. Society; Medical Cosmos.*

On a New Form of Gold Plate for Suction Cases.—Having recently had some considerable difficulty in making satisfactory suction cases in hard flat palates and also in lowers where much absorption has taken place, I found after a good deal of experiment, that if the surface of the palate in contact with the gum is closely covered with minute indentations similar to what would be made with a dull-pointed punch, a plate which would not adhere without springs became at once a good and steady suction case, firmly resisting side motion, and adhering well. The cause of the improvement is very easy to understand; the minute pits or indentations acting not only as small suction chambers but causing minute corrugations on the gum, which firmly resist side motion.

It is of course necessary that these pits are made in the plate before striking up, and that they shall be small enough in diameter to retain their shape between the dies; in fact the surface of the plate should be completely covered with small indentations. I think if any maker of gold plate would go to the expense of making a roller specially for this purpose it would be found a good investment. To make plates this way with a punch is a very troublesome process, and does not give the regular and neat appearance of machine work. The old plan of roughing a plate with a sculptor is something similar in effect, but has no comparison so far as improvement in holding power is concerned.—*Thomas Fletcher, F. C.S., in British Jour. of Dental Science.*

Bleached Tincture of Iodine.—

℞.—Tinct. of iodine,
Glycerin, pure, āā ℥i;
Sulphite of soda, ʒi.

Rub the salt to a powder in a small mortar, and add the glycerin gradually; then pour in the tincture of iodine and triturate gently until a solution is effected, and the mixture assumes an amber color.

It is claimed that the properties of iodine are increased by the addition of the sulphite of soda, and that the glycerin enhances its value and convenience for local application.—*Pharmacist and Chemical Record.*

The Recent Alleged Death from Ether.—For ourselves, if called upon to indicate, in the absence of complete evidence, the probable cause of this death, we should perhaps rearrange the statement somewhat as follows:

A man of nearly seventy years, reduced by a fracture near the trochanter, of eighteen days' standing, and by pneumonia, was subjected to a somewhat protracted inhalation before coming under the influence of ether. At the end of ten or twelve minutes his breathing became so feeble and irregular that etherization was suspended and artificial respiration was resorted to. In the course of four or five minutes more, there being some muscular action, the respiration being also stronger, and the pulse better, the ether was again administered, but the same bad symptoms soon supervened. On examination, the pupils were now found to be dilated. The heart was still beating (although there was probably no pulse at the wrist), but attempts at resuscitation were this time ineffectual.

Such an account would better accord with previous experience. The vitality of a patient enfeebled by age and disease proves to be easily depressed, and, after giving to the operator good and sufficient warning of his enfeebled condition, he succumbs; an occurrence which may serve as a fresh and salutary lesson to the surgeon to exercise care during anæsthesia by ether, and still more by chloroform, of a system thus depressed; but an accident we believe to be impossible to ether, with the pulse held and the respiration attended to.

On the other hand, we repeat, no precaution yet devised by human ingenuity will prevent the insidious shock of chloroform, in even a small dose, from occasionally and abruptly killing a healthy subject. This is the peculiar and usual *death from chloroform;* and of its approach neither pulse nor breathing gives indication.—*Dr. H. J. Bigelow, in Boston Medical and Surgical Journal.*

MORE DEATHS FROM CHLOROFORM AND FROM BICHLORIDE OF METHYLENE.—In our last two numbers we have referred to the important issue of the comparative safety of the various anæsthetics in use, and have ventilated the subject with an earnest desire of attracting attention to the question of safety in anæsthesia, and how it is best to be attained. From recent inquiries, and chiefly owing to the discussion of the question of the superiority and safety of ether as an anæsthetic agent, which has been lately presented in our columns to our readers, the question is an important one; and the impression is daily gaining ground that the professional men have been rather remiss in searching after a safe anæsthetic, and have got into the habit of too contentedly contemplating the dangers which have been escaped,—often too narrowly,—or consoling themselves with the reflection, in cases where death occurred, that they had "but done their duty," and had availed themselves of the light which the present state of medical science afforded. The public mind is, however, becoming more awake and anxious about the dangers which are thus passed through; and when, week by week, additional evidence is being accumulated, it is no longer a time to halt between two or more opinions as to what anæsthetic agent will afford the greatest security to the patient and best ensure more general confidence.

Three more cases are added this week to the anæsthetic obituary.

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These cases of death and these verdicts of coroners' juries are but painful repetitions of others recorded, where precautions were taken and where careful examinations of the internal organs had been made, and they illustrate what is perhaps the most disturbing and unpleasant qualities of chloroform and bichloride of methylene, their treachery. Ether, which has been hitherto in a great measure set aside in these countries by chloroform, carries with it strong recommendations in view of these distressing results. Is it just to our patients to use an agent so weighted with dangers, when a far safer one, and now as convenient a one, is to be had by the use of ether, which as yet stands at the head of the list as the safest of all the anæsthetics in use? We again recommend this subject to the careful consideration of the profession.—*Editorial in Medical Press.*

Clinical Instruction.—"For mercy's sake, gentlemen, let us have a little less science and a little more art," is the exclamation of Trousseau in his introductory lecture on clinical medicine. The suggestion is one that may very fitly be dropped into the ears of both teachers and students at the beginning of another winter session. It is more than ever necessary that the teaching of medicine and surgery should be practical and clinical. Students aforetimes used to think of little but their examination, which, being a theoretical one, could be prepared for in a great measure by reading books. It is the great merit of any recent changes in the system of examination that they have become clinical and practical. In other words, before actually getting into responsible practice, the student is confronted with the cares and the difficulties which he will encounter as a practitioner, and upon his familiarity with which and with the treatment of which his future happiness and success will mainly depend. The examination is a kind of anticipation of practice. . . . . There is some difference of opinion as to when students should begin to attend hospital practice. We shall not stay to settle this further than to say that, even from the beginning of their medical studies, they should steal an hour whenever they can to see cases, or to see any special thing done for the relief of cases—always of course on the understanding that they do not neglect the immediate work in hand. All medical education is a failure that does not familiarize the student with actual cases of disease, and make him easy in the use of remedies and in the practice of common and frequently-needed operations. There is still, in England, great need of more perfect arrangements for clinical teaching. Hitherto teaching has been far too stilted and formal and systematic. . . . . The great thing is for teachers as well as students to realize the responsibility of clinical work. Physicians that undertake teaching work should give time to it. They should be well paid for it; and then forego some degree of practice in order to teach.—*Editorial in Lancet.*

A Reliable Test of Death.—In 1870 a prize of twenty thousand francs was offered by the Academy of Sciences of Paris for the discovery of some positive sign of death, one which can be applied at any time by non-medical persons, requiring no apparatus, and unmistakable in its indications.

Of course a number have been proposed. The latest, and so far the best, is that suggested by Dr. Hugo Magnus, of Breslau, in *Virchow's Archiv* for August 19th, 1872. It is simple, physiological, and conclusive, being based on the fact that when the circulation positively ceases the man is dead. No matter how profound the coma or trance, no matter how death-like the lethargy, some circulation *must* continue, be it ever so sluggishly. Once it has stopped, resuscitation is impossible.

All that one has to do, therefore, is *to tie a string firmly around the finger of the supposed corpse.* If there is the least spark of life left, that is, if the blood circulates at all, the whole finger, from the string to the tip, will gradually turn a bluish red, from the engorgement of the veins. Nothing else, no post-mortem infiltration, can be mistaken for this appearance.—*Philadelphia Medical Times.*

For Keeping Pathological Specimens.—Dr. J. R. Shellenberger writes: For keeping pathological specimens I employ the following: Common table salt, ℥iv; powdered alum, ℥ij; bichloride of mercury, gr. ij; water, pure, O ij.

If the preparation is delicate, take four pints of water. If it contains any osseous tissue, leave out the alum and double the salt.—*Medical Record.*

Use of Hæmatoxylin for Staining Animal Tissues.—The ordinary logwood extract is finely pulverized in a mortar, and about three times its bulk of alum (in powder) added. The two ingredients are well rubbed up together, and mixed with a small quantity of distilled water. The *complete admixture* of the alum and hæmatoxylin is necessary, and this will require fifteen to twenty minutes' vigorous stirring. More water may now be poured on, and the solution, after filtration, should present a clear, somewhat dark violet color. If a dirty red is obtained, more alum must be incorporated, and the mixture again filtered. By always having an excess of both alum and hæmatoxylin in the mortar, a saturated solution can be obtained, which, after filtration, may be combined with alcohol,—one ounce of the logwood fluid with two drachms of seventy-five per cent. alcohol. I have found that a much better color can be had by allowing the mixture, after thorough trituration, to stand for several days before filtering and adding the alcohol. Should a scum form on the surface of the liquid after it has been some time made, a few drops of alcohol and careful filtering will be all that is required. With a strong solution, such as has been described, the coloring is very rapid, requiring but a few minutes; whereas, if a slower tinting be desired, the fluid may be diluted with a mixture of one part alcohol and three parts water. Whether the tissue has been previously hardened in alcohol or in any of the chrome compounds, it is colored equally well,—the nucleus of a most brilliant purple, the cell-body of a distinct neutral tint. An *over-staining* causes an almost perfect blackening of the nucleus, while the protoplasm becomes purple. In many instances where carmine has given but indifferent results, hæmatoxylin will be found to succeed most admirably. As to the stability of the coloring, I need only remark that specimens tinted and mounted in December, 1869, show as perfectly as when first put up.

I would conclude with the following method of treating pathological new formations (histoid tumors), etc.:

The cut is placed for the required time in the hæmatoxylin fluid, and is then immersed in distilled water to remove the crystals of alum which might otherwise adhere to the surface of the tissue. From water the section is transferred to seventy-five per cent. alcohol, when, after soaking for from ten to fifteen minutes, it is clarified in oil of cloves, and may be either mounted immediately in balsam dissolved in chloroform, or in damar varnish.

It might appear contrary to all that has been written on the subject of treating tissues to advise that the section should only be placed in moderately strong alcohol before clarifying and mounting, but by means of oil of cloves and the process I have given none of the curling up and distorting will follow, which cannot be avoided when absolute alcohol, benzole, or turpentine is employed to dehydrate and render transparent.—*Dr. J. W. S. Arnold, in Phila. Med. Times.*

Laudable Discontent.—In an opening address delivered at the Birmingham and Midland Institute, Canon Kingsley is reported to have said:

"He wanted to make every man, woman, and child, from the highest to the lowest, discontented with themselves. He wanted to awaken in them about their physical, their intellectual, their moral condition, that divine discontent, that noble shame which was the parent, first of upward aspirations, and then of self-control; for to be discontented with the divine discontent, and to be ashamed with the noble shame, is the very bud and the first growth of all virtue. . . . . I would make them discontented with what they call their education, and say to them, 'You call the three royal R's education. They are not education; no more is the knowledge which would enable you to take the highest prizes in this institute. They are not education; they are only instruction—a necessary groundwork in an age like this for making practical use of your education, but not the education itself.'"—*Med. Times and Gazette.*

Isinglass Cement.—Isinglass, soaked in sufficient water to render it soft, is dissolved by the aid of a gentle heat, in as small a quantity of acetic acid as possible. In each ounce of this solution dissolve five grains of ammoniacum, and add a solution of fifteen grains of mastic, previously dissolved in ninety minims of alcohol, sixty-five c. p. Mix well together.—*Canadian Pharmacist.*

Cement for Glass and Porcelain.—The very best of this kind, which will withstand moisture, and even a moderate degree of heat, is the one proposed by Berzelius, and for the last year or so sold by enterprising venders in the streets of New York. It is nothing but the curd of skimmed milk (obtained by the addition of vinegar or rennet), beaten to a paste with quicklime in fine powder. A better quality than this is obtained in the following way: Add vinegar, one-half pint, to skimmed milk one-half pint; mix the curd with the whites of five eggs, well beaten, and enough quicklime to form a paste.—*Druggists' Circular.*

Diamond Cement.—Diamond cement, so very useful for repairing broken china, ornaments, jewelry, nicknacks, is made as follows. Take half an ounce of gum ammoniac and a tablespoonful of water; melt them together till they form a milky fluid. Then take one ounce of isinglass and six wineglassfuls of water; boil together till the quantity is reduced one-half; then add one wineglassful and a half of strong spirits of wine. Boil this mixture for three minutes, and then strain it through muslin, adding after, while hot, the ammoniacal fluid formerly made. Finally add half an ounce of tincture of mastic resin. The cement thus made is best preserved in small phials, in which it sets when cold. When required for use, it can be liquefied by placing the phial in a cup of boiling water.—*Technologist.*

Colored Cements.—A writer in *Comptes Rendus* states that colored cements which harden rapidly may be made as follows: He takes a solution of silicate of soda (sp. gr. 1·298) and adds to it, while stirring, first pulverized and previously washed lixiviated chalk, so as to form a thick mass, like butter, to which are added, for coloring purposes, the following substances: finely pulverized sulphuret of antimony for black, iron filings for gray, zinc dust for whitish gray, carbonate of copper for bright green, oxide of chromium for deep green, cobalt blue for blue, red lead for orange, vermilion for bright red, and carmine for a violet hue. This cement hardens within from six to eight hours, and may afterwards be polished, becoming like marble.—*Druggists' Circular.*

A New Species of Fossil Elephant.—J. W. Foster, LL.D., of Chicago, pronounces a fossil tooth, which has been found near Terre Haute, Indiana, to be that of an elephant, but of a particular species of the animal which differs specifically from any yet discovered. He states that not only is the tooth admirably adapted to the threefold work of crushing, grinding, and triturating the food as it passes in the various stages of mastication through the mouth, but that there seem to be high ridges of enamel and deep valleys of cement in it, which lend peculiar efficiency to its work, the arrangement of the teeth and jaws being like a curiously devised hopper with an upper and a nether millstone, in which the coarsest fibrous materials could be reduced to a pulpy mass. The characteristics of the teeth of all known species of elephants, fossil or surviving, brought into comparison with the tooth in question, exhibit striking differences—which are held to be sufficient to constitute the new species of *Elephas Mississippiensis*, whose height did not probably exceed six feet, being diminutive in comparison with the gigantic *Elephas Primigenius*, but nevertheless equally a mammal of the post-pliocene epoch, deserving of the closest study by American palæontologists.—*Scientific American.*

HINTS AND QUERIES.

Will some one of experience in celluloid tell me how to remove the teeth from an old celluloid plate so as not to injure the teeth?—Celluloid.

Will Prof. Barker, or some one, give the interrogator the exact formula of "Barker's ethereal preparation of iodine," for local application in periostitis or alveolar abscess?—G.

What is the character of the legislation being sought regulating the practice of dentistry in Pennsylvania.—A Novice.

We do not know that any effort in that direction is being made in this State. —Ed.

"New York, November 1st, 1872.

"Doctor,—This note comes to you in the interest of every dentist in the United States. If you have been blackmailed and swindled by Josiah Bacon for years past, you will be for years to come, *unless* some one dares defend their rights. We have taken that responsibility, and with your aid will rid the profession of Bacon and his patents. We ask from you the trifling sum of $5.00; at the same time we *will accept anything* from one dollar upwards. Be just as liberal as circumstances will permit. We have taken up for you a just and righteous cause.

We are not blind to the difficulties that beset us; but are well posted in all of the details of that most outrageous swindle and imposition, *Cummings's patent.* We know that the profession have heretofore been sold out to the Bacon party in every case he has been tried. We cannot expose our secrets here, but we pledge our lives that Bacon shall never do that same thing again. We are well known in the profession, and have sworn to defeat that patent. Don't let any excuse prevent you from responding at once to this call. We are determined to raise the money if we have to make personal application to each dentist for the trifling sum asked for. Give us your mite, and we promise you shall reap a hundred-fold. Hand your money to the agent, or send it direct to

"D. Ensign,
"Dental Depot, 733 Broadway, N. Y."

The above appeal has been circulated in some directions, and will probably be in others. It is proper to state that there is no such person as D. Ensign at 733 Broadway, New York, and that the "agents," who are traveling and soliciting funds for the party and for the purpose described in the circular, are impostors.—Ed.

Reply to "X. T."—"What is it not to interfere with nature's processes?"

A judicious physician recognizes that it is nature and not medicine that cures disease. Medicine is used as an adjunct to the *vis medicatrix naturæ,* never with the idea that it is to replace it; thus, in treating disease, the indications of a case demand the most inquisitive attention. A diarrhœa, for example, is not unlikely to have as its meaning the presence of an alimentary irritant which nature is exerting herself to dislodge. It would be sad, and might prove a fatal mistake, to interfere with such a natural process to the extent of administering medicines which should check such a diarrhœa. It is to interfere with nature's processes when attempt is made to treat any expression of disease without the full comprehension of the meaning of such expression; hence it becomes a rule with the experienced, that when an expression is not understood, the safest plan is to do nothing, trusting the case to nature, or, if not strictly this, prescribing for functional phenomena only.—A. B.

Reply to "Querist."—"Why does not the important subject of the management and treatment of children's deciduous teeth engage more of the attention of dental writers?"

Here is a query which shows fault in the querist, rather than in writers whom he would condemn.

A text-book,—let us take a text-book as an example,—if properly and usefully written, deals with principles and not with special cases. A magazine writer, on the contrary, when writing with interest for his fellows, deals with and presents his special experiences. Now, principles underlie all practice and apply necessarily to all kinds of cases; special descriptions act as hints suggestive of the application of these principles. To comprehend and appreciate the management of the deciduous teeth involves, first, that the physiological process of dental evolution be understood; how teeth form and develop; what circumstances of health, food, and hygienic associations influence the development, insuring health, or compelling disease, etc. Second. The periods and associations of replacement, modes of enlargement of maxilla, lesions belonging to and begotten of the particular age, and the functional activity pertaining to the changes in progress. These matters surely are to be found discussed in any and every proper text-book, and it is here alone that the full and proper understanding of the circle of the subject is to be looked for. A fault of the profession, a very grave fault, lies in seeking instruction through isolated examples rather than in seeking to comprehend that of which examples are but as offshoots.

An ounce of principle is worth a pound of practice,—worth many pounds, for in the principle which is to be freely and perfectly understood in a single moment, perhaps lies an extent of practice which few might have the power to memorize.

The principles or laws governing dentition being understood, each and every case, no matter what the peculiarity, has found within itself self-explanation and self-direction.—O. P.

Reply to "Junior."—"What is the best material for filling incisor teeth when the patient is unable or unwilling to pay for gold?"

The difference between being unable and unwilling is very great. A miser, with a hoard of gold, being unwilling to have some of his wealth placed in his teeth, would not be at all an object for professional sympathy or relief. A poor sewing-girl, valuing her teeth, yet unable to render compensation for services needed, might only receive the best treatment, let this be what it might. A professional man never yet lost in taking God as the paymaster for the poor. Gold, however, is not a necessity for the preservation of carious teeth, incisors, or others; and in very many cases the practitioner may wisely consider the employment of other material besides this metal. As an example: taking teeth very much decayed, chalky in substance, and of little resistive force, it is often enough found to be the case that a good preparation of the oxychloride of zinc carefully inserted and properly shielded for sufficient time from moisture will insure a result not obtainable by gold, while still again cases present, where, from peculiarities in the saliva, an electro-chemical action which mocks at gold finds antagonism in gutta-percha. One particular case in this latter direction is recalled by the writer, when, unable to combat a neck cavity with gold, the common red gutta-percha was resorted to and remains as good and preservative to-day as on that of its introduction five years ago.

Tin, as a substitute for gold, is a most worthy and reliable metal. Tin-foil, as a plugging material, is in every way as preservative as gold, and, in respect to non-susceptibility to thermal impressions, may claim the advantage; that it is less able to withstand the mechanical influences of mastication, is but a slight and unimportant objection. An objection, however, that may be urged to the use of tin in the front teeth resides in its color; such objection, however, finds modification in the manner of its employment. Modern manipulation employing the V-cut with the base looking backward does not at all allow a filling to show; hence, while it must unfortunately be admitted that where a filling of tin is large it takes away necessarily somewhat from the translucency of the tooth, yet the plug, as a plug, shows nothing of its own immediate face. In incisor teeth, dark or unimportant, as looks are concerned, "Junior" may accept the assurance that tin-foil will be wisely used by him; in the teeth of females, on the contrary, if gold for any reasons may not be employed, and if tin from color should, on trial, prove itself objectionable, let him resort to Guillois's cement or other preparations of the oxychloride, to white gutta-percha, or to the compound known as Hill's stopping.—Senior.

THE

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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

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(Continued from page 22.)

PATHOLOGICAL dentition may be divided into three kinds: 1, that which is moderate in severity; 2, that which is decided in severity; 3, that which is dangerous in its severity. The first form I divide into two stages,—that of *inception* and that of *culmination*. The inceptive stage of this kind of pathological dentition is indicated by the *first few* signs which have already been given as peculiar to this condition: the child becomes different from usual; it worries; it is difficult to amuse; it becomes cross; it declines its customary amount of food; it requires an undue amount of attention, and evinces dissatisfaction with even the kindest care; its sleep is disturbed, and is of short duration, and it awakes fretful and flushed. This condition of things is ordinarily of two, or possibly three days' duration, when the culminative stage rapidly supervenes; the worrying becomes almost constant; the petulance increases; the hair is tossed about and the flushed face is marked by lines indicative of trouble; food is almost completely declined; sleep is much broken. The night is passed by the parents or nurse in wakeful, anxious watching; the determination is made to request the services of the physician the next day; but the next day the tooth is through, the child is markedly better, and on the next it is as well as usual,—four days of worry and suffering for the child, four days of troublesome care for the parent, and a long night of pain, wakefulness and watching for both: all for the want of a touch of the lancet.

The second form, that which is decided in its severity, I divide into three stages,—inceptive, cumulative, and culminative. As in all phases of disease, the health, strength, and temperament of the infant has everything to do with the severity of pathological dentition; and thus it is that we find children of nervous, nervo-sanguine, and nervo-bilious temperaments, which have been tenderly reared, and weakened by protection instead of properly strengthened by judicious exposure, vastly more liable than others to come within the range of this second kind of painful dentition. In such cases the inceptive stage is not usually so observable as it is in those of the first kind, from the fact that the children are naturally more restless, naturally require more attention, and are naturally more liable to alterations of systemic condition,—thus having, as a frequent occurrence, most of the signs by which painful dentition is at first announced; but when, as the result of several days and nights of restlessness and suffering, decided increase in severity of disease takes place, and when the usual play is entirely abandoned, the usual food almost entirely refused, the usual daytime sleep entirely declined, and the flushed face and almost constant troubled crying denote that something more than household nursing is required, then, very properly, the advice of the family physician is requested, and the needed relief afforded through the agency of appropriate soothing and strengthening medication and the lancing of the gums; but, on the contrary, how frequently is it the case that the latter, and by far the more important part of the treatment, is omitted, and the efficacy of the medicine administered entirely prevented, from the neglect of *removal of the cause!* In these cases the cumulative stage then fairly commences, and, unless under the influence of narcotics, the little patient daily and nightly palpably grows worse, until it has to be constantly in the arms, constantly rocked, and is the source of constantly increasing anxiety. Under the influence of this powerful irritation, systemic complications soon supervene; constipation, with its attendant flatus and pain, or, on the contrary, frequent, watery alvine discharges, announce the presence of enteric difficulty; fitful drowsiness and depressing slumber indicate cerebral complication, and the quick and frequent pulse denotes the heart's sympathy with this decided deviation from the normal condition. Sometimes so long a period as two or even three weeks of this kind of suffering and exhaustion is *permitted*, as the result of the effort on the part of two, three, or four teeth to erupt. The child becomes pale and emaciated, and its condition of physical prostration is truly alarming; parents and nurses show evident signs of exhaustion, and it is alike curious, sad, and suggestive to see the anxiety with which the red and swollen gums are watched as they increase day by day to the angry redness and painful distention of culmination,—the sad pleasure with which, at length, the expected whiteness is discerned, and the outspoken joy with which is made the announcement of the final appearance of each successive tooth. Then, with what rapidity recuperation marches on! with what satisfaction the diurnal report of "a great deal better" is made and *received!* What shall we think of this? What can we think of this, other than that it would have been better for the parents, and far better for the child, if "consultation" had been indulged in with some dentist who possessed that kind of professional knowledge which, based upon the broad foundation of general principles and general medical education, had been developed by thought, study, and practice as a dental specialist?

But again: we have more serious results than these (and not unfrequently), in what I class as the third kind of pathological dentition, or that which is dangerous in its severity. In this class we find little patients who are both strong and weak; we find those who are naturally very rugged, and those who are very feeble; and, as in all other phases of disease, we find the danger on the one hand to be from the strength of the patient, all pathological conditions assuming, as I have stated when upon general principles, the violent type, and, on the other hand, the danger from abnormality, with absence of necessary vital power. When, under these conditions, dentition becomes a painful process, it assumes, either quickly the form of violent acute disease, with rapidly accumulating severe symptoms, indicative of danger, or slowly but persistently the form of seriously chronic disease, with all its list of hopeless, sinking, adynamic complications. In either case it becomes a condition really to be dreaded,—a condition which unquestionably requires for its successful treatment far more than ordinary requirements, far more than ordinary skill; judicious medication, judicious surgical interference, and the best nursing are all sometimes insufficient to ward off the shaft of death. How, then, *must* it be with those who have not the advantage of these?

In cases of the third class, beginning as they do with the usual signs and symptoms of incipient dental irritation, each aggregates according to its type: the *acute*, in the inceptive stage, presenting in the feverish petulance and restlessness of movement *that* EFFORT *at resistance which is so soon to prove so detrimental*, which so rapidly hurries on and aggravates the changes of the cumulative stage, with its quick and frequent pulse, its flush of fever, its bowel, brain, and stomach complications, with their concomitant diarrhœa, drowsiness, and vomiting, and hastens fearfully, like the sweeping of an uncontrollable fire, on to its culmination, with the scalding and high-colored urine, the frequent thin evacuations, the face-blackening convulsions, the perfect stupor (most dangerous sign), and the looked-for, but none the less unexpected, death. These are the cases where there is *no time to wait*,—where nothing *more* than "redness and tumefaction" may present before it is *too late*,—where the only "whiteness" is the whiteness of death. These are the cases where nothing but constant watchfulness in hygienic care and promptest antiphlogistic medication, together with the best and most efficacious kind of "lancing," can be instrumental, under Divine permission, in bringing the patient safely through.

The *chronic* of this class, in the inception, presents a nervous irritability, an indisposition to move about, a tendency to loll around, *that* ABSENCE *of resistance which is so soon to prove so detrimental,* which is to permit the patient to pass unresistingly on to the cumulative stage and to sink gradually but hopelessly into the quiet dangers of culmination. With these patients we have almost invariably liver complications; bile is secreted in excess or ceases to be properly eliminated, in either case giving to the skin and cornea the sallow and yellowish tint, and to the face that distressed and discontented expression, indicative of this condition, and denoting necessity for attention in this direction. We have these little sufferers gently moaning as they lie feebly rolling from side to side, and looking from their soft eyes the mute glances of imploring helplessness. Like the acute form of this class, these patients have their other systemic troubles, but all of them are dangerous from their persistence and uncontrollability instead of from their violence. In these cases *stillness* ensues to a remarkable degree; all signs of suffering pass away, all nourishment is declined, the dark-lined and sunken eyes are mostly closed, the hollow cheeks and shrunken arms and hands show wonderful emaciation,—a gentle, gradual stupor settles over them, and they softly approach the sleep that knows no earthly waking. If the acute form of this class of pathological dentition requires prompt and decisive skillful treatment, the chronic requires no less careful manipulation. Any undue haste will surely exhaust vitality, and equally surely will life depart if there is any lack of watchfulness or undue tardiness to respond to its feeble calls for help. It is in these cases that we are liable to have exhausting hemorrhage as the result of lancing, and this should therefore be carefully watched, and even preventive medication (which will be given in place) indulged in, to make "assurance doubly sure."

There is probably no examination necessitated by conditions within the scope of dental pathology which is more difficult to make acceptably than that of the mouth of an infant suffering from the middle or severe stage of pathological dentition; and it is of course as impossible that all should succeed equally well, as it is that all should be equally acceptable in any other direction with children; but sufficient instruction can be given to prevent much of the awkwardness that is frequently exhibited, and much of the pain which is sometimes unnecessarily inflicted. If an infant has been reduced by teething to the extreme of weakness, and has become almost insensible to any treatment, there is nothing to recommend in connection with making the examination except gentleness combined with thoroughness; but if, on the contrary, the little sufferer is highly irritated and naturally more than ordinarily timid, if all the parts are highly sensitive and the fears of the parents are added to those of the patient, then much might possibly be advantageously given in the way of direction.

I have already spoken of the advisability of previous education of parents, and this will be amply proven to be correct as cases in practice multiply; therefore when it has not been done, all opposing ideas, theoretical and practical, should be viewed with leniency and combated with firmness, largely mingled with kindly moderation, remembering that thoughtlessness, haste, and harshness cannot be tolerated in connection with the helplessness of the "little ones"; when, therefore, an examination is deemed necessary, the endeavor should first be made to select the *best* assistant; this will generally be found to be the one most rationally desirous that it should be made, and that the operation, if required, should be performed; again, this will usually be the one who best controls the child, whether parent, nurse, or relative. The age of the infant should be inquired, in order to determine *probabilities*, and the appearance of the little patient in the way of strength, development, and temperament, noted in connection with such information as can be gained in regard to previous dentition, if such has occurred; general health and inherited peculiarities of dentition, in order to determine *possibilities*. This having been done, the assistant should be directed to sit upon a chair opposite the operator (he also sitting), and take the infant upon the lap, lying down, with its face upward, its head resting upon the left thigh of the assistant, whose left hand should hold the head gently but firmly by being placed upon its forehead, and thus *covering its eyes*. This I regard as an important direction, as it is of fourfold utility. It enables the assistant to hold the head securely; it prevents the child from being frightened through the agency of sight; it prevents the action of the pathetic nerve (already so potent to implore) upon the feelings of the assistant, and it prevents the association of the face of the practitioner with restraint, and the infliction of even momentary suffering. The right hand of the assistant should take both hands of the infant, these being crossed upon its abdomen, as thus they can be held, while at the same time the body is partially prevented from moving. The legs of the infant should be taken under the right arm of the assistant and securely held, thus precluding the possibility of struggling, and equally acting as a valuable safeguard against accidental wounding during lancing; for examination of the lower jaw the head of the child should be toward the light; for examination of the upper jaw the feet of the child should be toward the light. In making an examination for an infant under ten months old, the forefinger of the right hand should be gently introduced *at the corner* of the mouth, by which means that portion of the gums which is irritated and consequently tender is avoided, and a part impinged upon which is probably just enough irritated to make pressure or rubbing agreeable. Not unfrequently a little rubbing of the posterior portion of the gums, together with gentle pressure downward, will cause the infant to open the mouth wide, and thus permit easy examination. By inattention in this direction, the finger is oftentimes, and indeed usually, insinuated between the lips at the front portion of the mouth, and, coming in immediate contact with exceeding sensibility, great and unexpected pain is produced; the infant screams and struggles, and tightly closing its little mouth and lips, uses its utmost endeavors to prevent a repetition of that which it is thus taught to dread. In making an examination for infants over ten months old, the finger should be introduced at the front of the mouth, as thus the centrals, and usually the laterals also, being fully erupted, all contact with tenderness is avoided.

It having been decided, in view of existing tumefaction, redness, and tenderness, that lancing is evidently indicated,—*or, in the absence of these*, that the *age* and existing *peculiar* signs of systemic derangement already alluded to indicate the advisability of this operation,—the lancet (either an ordinary pocket lancet, or much better, a narrow-blade, curved bistoury) should be wrapped with a piece of tape, beginning about a quarter of an inch from the point, and covering the remainder of the blade and a portion of the handle, securing it by slipping the end of the tape under the last turn and drawing it tight,—the object of this is to prevent possible cutting of other parts than the gums, by the superfluous length of blade edge. This having been done, that portion of the gum which covers the irritating tooth should be taken gently between the first two fingers of the left hand, the thumb steadying the jaw by resting under the chin or upon the cheek, as thus, in any part of the mouth, the tongue, lips, and cheeks are protected; the incision should be made slowly, steadily, carefully, and gently, passing through the gum until the enamel of the coming tooth is felt, but *only felt*, as this tissue is yet not so hard but that it might possibly be injured by undue force in cutting.

(To be continued.)

OSSIFIED PULPS.

BY S. P. CUTLER, M.D., D.D.S., HOLLY SPRINGS, MISS.

Case 1.—A young lady, seventeen years old, has the upper deciduous cuspid in her mouth, though loose and dark; half the fang absorbed away, more on one side than on the other.

On extracting it, it presented the following appearance: the crown and portion of neck and fang were sound, containing an ossified pulp, which projected some distance beyond the normal dentine, the dentine having been absorbed all around the pulp, which had resisted absorption, except on one side, which was slightly absorbed; the ossified pulp appearing to be perfectly united with primary dentine, filling the entire pulp cavity complete.

The permanent successor was in contact with the projecting ossified pulp; worn smooth at point of contact, owing to movement of deciduous tooth in use.

The tooth was loosened to that extent that all vitality was cut off, which probably would not have been the case had the pulp not ossified; it may have died, which is frequently the case when these teeth remain too long.

Most of this young lady's teeth are good. Her complexion is very fair; temperament nervo-lymphatic sanguine.

Under the microscope this specimen gave the usual appearance witnessed in secondary dentine.

Case II.—I have two similar specimens from the mouth of a little girl fourteen years old. The two superior bicuspids, with about one-third of fangs absorbed away; the nerve canals at the point of fangs completely ossified, except a hairlike opening for the remaining pulp, which was alive in both at time of removal, the crown portion not being ossified to the same extent.

I made a microscopic specimen of one of them with portions of the soft pulp *in situ;* the appearances being about the same as other similar specimens, the soft portions of pulp showing fibrillar peculiarities and other structures, with little evidence of vascularity.

These teeth were not worn to any extent. The girl, a delicate subject, nervous temperament, intellectual and precocious, not much physical endurance; complexion fair, eyes blue. She has nearly all of her teeth decayed, including all of her under front teeth, and all filled and in a state of preservation, though very sensitive. Under proper regulations of her diet for the last twelve months, her teeth have improved wonderfully, and may last her a long time and do good service.

Case III.—A young man, twenty-five years old; has an upper left anterior molar with extensive proximal decay. The tooth had been filled twice—once with gold, and once with amalgam, the last having been out about twelve months; tooth hard and firm. There was some sensibility on excavating. The nerve is completely ossified, showing shape of pulp cavity of a dark-brown color; had never given any trouble. I filled with amalgam, and anticipate entire success; temperament sanguine; stout and healthy; teeth good.

Case IV.—A lady, about forty-five years old, married; has several children. She did not marry until about her thirtieth year; up to that time had lost scarcely any teeth, though had had many filled. I had not seen her for the last five or six years; now all of her molars (except the two superior six-year molars, which are well preserved by a filling in each) are gone, the fangs all being *in situ*, the mouth being in an acid condition, and teeth stained dark; takes good care of them.

The right superior lateral incisor has a large cavity of decay extending one-third across. On excavating, I found the nerve cavity ossified, and not sensitive; sound and firm. I filled with soft foil, and anticipate no trouble.

The left lower lateral incisor was decayed at the gum; anterior surface nearly half through the tooth; small and round cavity; slight sensibility. I filled with soft foil, and anticipate no trouble from it. The left superior bicuspid, anterior, was also extensively decayed, with some sensibility, but no exposure of pulp. I did not fill the tooth.

Her daughter, twelve years old, has grooves in her upper front teeth, —not deep. I am not aware of any syphilis having been in the family, on either side. She has chronic *ophthalmia tarsi*, slight.

Case V.—The other day I made an application to two first bicuspid teeth, one on either side above, to destroy the nerves; one of them having been troublesome for some time, the other having given no trouble, though tender on application of excavator,—so much so that I found it would expose the pulp and cause trouble to proceed further; made nerve applications, and requested her to call next day. The lady is about twenty-three years old. Next day I found some tenderness in both, similar to that of ordinary sensitive dentine, though not painful. Considering removal of pulp the best policy, I proceeded to do that, thinking there must be sufficient exposure from extent of decay; but on application of nerve broach, it failed to enter pulp cavity in both cases. On examination, I found no opening; on the contrary, solid bone; in other words, the pulps were ossified in both cases. There was still slight sensibility, but no pain, except when cold water was applied, which caused pain in one for a short time. Both had been filled; one had still a filling on the grinding surface, the main cavity being posterior proximal; this I filled with gold, and with the mallet, since which there has been no trouble.

The other is under treatment until all irritation subsides. The application to destroy the nerves seemed to have no other effect except to remove undue sensibility of secondary dentine, without any serious injury to the teeth, so far as I am at present able to determine. I do not think such treatment advisable when the fact of ossification is known, or even safe if we intend saving the teeth.

From my observation and experience in this direction, I am inclined to think that a large per centage of such cases may be saved permanently and made useful.

Now what I wish to come at is this: Is it not possible for us as dentists to encourage this ossific process, which nature is attempting to improvise as a means of self-protection, or it may be simply a coincident effect of a morbid cause, the result being the same in both cases? In other words, the process is a conservative one; if not too much hurried, there is very little local disturbance, which may ultimately cease altogether.

The other tooth I subsequently temporarily filled with os-artificiel, capping with spunk and creasote, which gave no trouble. In about two weeks after I filled permanently with amalgam, capping as before, since which time there has been no trouble, and I anticipate none.

Case VI.—A young lady, eighteen years old, has a right lower molar extensively decayed on grinding surface, down half the depth of the crown. This tooth has been decaying several years, progressing rather slowly; never giving her any trouble; could masticate with it without pain. I found no trouble in excavating; only slight tenderness at one point.

The old site of the nerve was imperfectly ossified, having rather a chalky and scaly appearance; also having rather a dilapidated appearance; I filled with amalgam, and apprehend no further trouble. Young lady is of a nervo-sanguine temperament, and healthy.

Some of my readers may question the propriety of filling such teeth with amalgam; still I have my reasons for so doing. We know that circumstances alter cases, and these circumstances control us to a great extent.

Case VII.—A young lady, about twenty-three years old, has a number of decayed teeth filled, and several teeth missing. The upper left anterior bicuspid decayed to pulp cavity; had been filled some weeks with os-artificiel; was quite sensitive at the time, and to cold water since. I removed the os-artificiel, and found some sensibility on excavating, the pulp hard and firm, and clearly defined. I filled with amalgam without any pain, and have no reasonable apprehension of results. She is of nervous temperament. Gold, I am quite sure, would not have done as well.

Case VIII.—A gentleman, about thirty-eight years old, stout and healthy, a "music teacher," of sanguineo-nervous temperament, has a number of decayed teeth and fangs, but few sound teeth; has had work done on them.

The superior anterior right molar extensively decayed on grinding surface and approximal side. On excavating, I found some sensibility more so at enamel; at one point the decay occupying a large portion of the crown. There was no soft pulp, but instead a hard, rather opaque ossification, vital in appearance; had never given any trouble. I filled the first with os-artificiel without pain; in two days after I removed all but a capping, and filled with amalgam, it being too frail for gold. I apprehend no further trouble, as his teeth are not of the aching kind.

Case IX.—A lady, thirty-nine years old, had been a patient of mine about five years ago; had several decayed teeth which had been filled; none missing then; some of the front teeth quite badly decayed, others not; one of the superior central incisors badly decayed on one side; the pulp having been exposed, but beautifully ossified, white and pearl-like in appearance; most of her back teeth good and sound. A dentist extracted all of her teeth above and below, and substituted a full set on rubber. I have seen most of the extracted teeth, and a large majority, in my opinion, might and should have been retained; but she fell into the hands of a slayer of dry bones, and the teeth not only went up but out. Her husband informed me that her teeth did not trouble her much, and were firm, and hard to extract.

Case X.—A young lady, about twenty-five years old, educated, of nervous temperament, has a central superior incisor decayed to nerve cavity; had been filled several years ago, the filling now having been out about twelve months. On excavating, there was some sensibility but no exposure, the pulp having ossified perfectly. I filled it, and have no doubt about results.

There was the second superior bicuspid "left," with deep decay on side, with exposed pulp. On excavating, there was some hemorrhage, but no pain. On viewing with magnifier, I could see nodules in pulp. After applying carbolic acid, I filled with os-artificiel, and have heard no complaint,—now several weeks.

Case XI.—A man, about fifty-five years old; bilious temperament; sound constitution; had a right first lower molar decayed on grinding surface, large, and deep into the tooth, reaching to pulp.

On excavating there was some sensibility in the enamel region, also at former site of pulp, the pulp being beautifully ossified, rather nodular surface (which I regard as characteristic in such cases,—*i.e.* in many), the color of ossified pulp brownish; had not given any trouble but once, about twelve months previous; masticated on it during the time. I excavated carefully, and treated with carbolic acid a few minutes; then filled with amalgam, without any pain, and I apprehend no further trouble in any respect. All the others good, with several gold fillings.

Case XII.—A lady, about fifty years old; good constitution; bilious temperament; had several decayed teeth, though had lost but few in the lower jaw. The superior right central incisor had decay on labial aspect, extending beneath the gum, average size, and was in a chronic condition; the centre of cavity extending half through the tooth; the pulp beautifully ossified, presenting the usual beadlike appearance. On drying, I noticed some moisture at one point, which repeated dryings did not check for some time, but it finally ceased altogether; I then filled it. The tooth had given no trouble. This oozing was from a small fissure on one side of the hardened pulp, from the soft pulp beneath. I apprehend no further trouble from it.

One reason why ossific deposits do not oftener take place under a decaying surface, when reaching the neighborhood of the pulp, is, in my opinion, the result of an acid action, disintegrating the tooth substance, and penetrating the tubuli down to the cavity, more or less, and sufficient in a majority of cases to prevent ossification just under the decay —the very point where the greater amount of vital weakening occurs, favoring this process.

The acid influence in the decaying dentine is no doubt one chief cause why ossification does not oftener occur, as before stated.

One fact I am quite certain of,—*i.e.* where there is decay penetrating deep into the tooth, there has necessarily been weakening or lessening of vital resistance, just under the disintegrated region, if not in the entire pulp; and just in proportion to such weakening is the tendency to mineralization, when not counteracted by the cause stated above.

The mineralizing process, though a downward tendency, is under vital control, to a certain extent, as this process ceases as soon as the death of the pulp is announced; as the one fails the other follows on, other things being equal.

In view of the above facts, my plan has been to use some alkali in the decayed tooth for a day or two, and then treat with carbolic acid, or something else, and to fill temporarily with Hill's stopping, or os-artificiel, and wait results for an indefinite time; or, in many instances, fill at once permanently, each case indicating the proper plan to be followed at the time.

One of two things, as a rule, is quite certain: *i.e.* where there is an extensive decay in a tooth, so that there is no very sound dentine at the bottom down to the pulp—either ossification of pulp cavity under decayed region, pulp nodulation, more or less extensive, or complete ossification of the crown portion of the pulp to an indefinite extent down, or death of the pulp takes place. The latter result may be attributed to various causes or circumstances, both local and general, depending in some instances on feeble neural resistance, resulting in stasis of circulation, inflammation, and death (with or without much pain) of the pulp.

Death of the pulp must be the direct result of strangulation, from capillary distention and consequent congestion, ending in inflammation and strangulation, or choking, as it might be considered, largely depending on mechanical conditions, of the interior of the tooth,—*i.e.* minute foramen, larger chamber, and solid walls. Now, so long as the circulation can be kept up in any tissue, to anything approaching that of health, no death of such part is likely to take place; and so long as the blood that enters a tooth returns with a given momentum and in due time, no death takes place. I cannot say precisely what this given momentum is, but must imagine it to be somewhat above the zero of the circulation. Supposing the zero to be the lowest possible point of recuperation or reaction, and return to health, this strangulation and death may take place in a tooth pulp within twenty-four hours, that period being the shortest time coming under my own observation, where no poison has been applied; where there has been, in a much shorter time. In other instances of spontaneous death indefinitely long periods may supervene.

There are other instances where there has been slight exposure of the pulp, and a gold filling inserted without any protective covering; and several years afterwards, on removal of such filling, the pulp would present the same exposure without any indications of closing over by osseous covering, the tooth during this time having given no trouble. Still, it would be but reasonable to suppose that such pulps possessed but a low degree of vascularity, and were not prone to take on inflammation, or even irritation enough to cause ossification, the tenacity to life being strong in the meantime. Such cases are not common,—they might be regarded as exceptions to the rule.

In cases of actual exposure of pulp, I always apply a small bit of punk or *spunk*, touched with creasote over the opening, and then cap with some temporary stopping, hoping to save the tooth by ultimate ossification, and then permanently filling. The reason why I use the spunk is that it is elastic, and will yield to the protrusion of ossific matter through the opening, *like a bead*, which we frequently notice where there has been no stopping at all to prevent; also from its protective influence from contact with the more irritating and unyielding stopping; some cases I have successfully treated in this manner, resulting in the bead- or pearl-like excrescence through the opening, though not as prominent as is sometimes seen where there has been no stopping at all used.

In ossifications in pulps, as a rule, the nerve fibrils alone resist ossification; the blood-vessels even suffer differentiation and ossification, more or less complete. Sometimes the coloring matter of the blood is retained, indicating the original site of the vessel, though perfectly hard. The pulp substance (except the fibrils) degenerates into a dental matrix in this process.

Wedging teeth injudiciously, violent jarring from blows, biting hard substances, and all other causes that in any way disturb the normal condition, more or less favor pulp ossification, occlusion of pulp-chamber and tubuli, and cemental hypertrophy.

The secondary dentine, "so called," resists the ravages of decay to a greater extent than primary dentine, as we oftentimes notice that as the decay progresses after the pulp has completely ossified, the ossified pulp projects up boldly, the primary dentine having given way much more rapidly, and some time elapses before the new formation shows any signs of disintegration.

I will mention here a case I reported in the *Canada Journal of Dental Science*, nearly two years ago, where there was an exposed pulp of an upper molar, that I treated by capping with spunk and temporarily filling over with os-artificiel, that completely ossified at the point of exposure within six months; and twelve months later the tooth was in a condition to receive a permanent filling, having given some trouble at times during the first twelve months; and now I regard the tooth to be in a salutary and safe condition, performing valuable masticatory duties. What can be done in one case may be done in other similar ones, under like circumstances, as a rule.

TREATMENT OF EXPOSED DENTAL PULPS.

BY C. E. FRANCIS, D.D.S., NEW YORK CITY.

In a report of the proceedings of the Iowa Dental Association, published in the October number of the *Missouri Dental Journal*, reference is made to an address upon the above-named subject, "which," said the speaker, "has been revived lately, and at this time is receiving great attention."

This is certainly gratifying intelligence, and evinces a disposition to keep up a healthy degree of vitality in the profession, as well as in the pulps of the teeth they are treating.

Considering all that has been written and published upon this subject, and the many discussions it has caused in the various dental associations throughout the land, one might well suppose that nothing further could be stated that would be of interest to the profession or to any of its members, were we not continually reminded of our shortcomings or "dark wanderings" in methods of practice. Some of us are continually adopting this or that method, or trying such and such "remedies" (hardly knowing why): some with much success; others with little success; many with no success; and this appears to be the drift of our "experiments," as stated or recorded. That all these grades of success or ill-success result from operations performed by different individuals, is a matter that need surprise no one. We may all strive to reach the same point, but we move in divers ways. We step heavily or lightly. We move in direct lines and follow unmistakable paths, guided by beacon-lights ahead; or we drag and plod through intricate ways or into unexplored marshes, with the treacherous glimmer of the will-o'-the-wisp to allure us only deeper into the swamp. Blind experiments may sometimes cause one to stumble into a channel of success, but chances are decidedly against so favorable a result. Whether we experiment blindly or with some degree of reason, we should carefully study into and note the cause of each success or failure, and so show progress in our experiments.

But to return to the subject: no one will deny that a tooth containing a healthy living pulp is of more value than if pulpless,—at least such is the rule; therefore it is desirous to preserve the vitality of the pulps in such teeth as we are treating, if possible to do so.

If by an unlucky turn of the excavator a healthy pulp gets suddenly uncovered and wounded, there is no necessity for destroying its vitality. Proper care and gentle treatment will almost invariably save it. Indeed, we have but to prevent inflammation by keeping away irritating agents, and the pulp will soon heal by first intention and deposit a sufficient amount of calciferous matter to fill the breach, and thus protect itself. Now let us see how this may be accomplished. If the tooth is aching, apply just sufficient carbolic acid to allay the pain; then cover with a small cap of note-paper, and carefully fill with a tolerably thick paste of oxychloride of zinc. This has been my method for several years, as has been repeatedly stated and published. I have found, however, that though protected in this manner, pulps would sometimes become irritated by the application of the zinc, thus endangering their vitality. Recently I have overcome this trouble, and now have little fear of such danger. After applying the carbolic acid, and carefully mopping out the excess with a bit of soft spunk, I cover one side of the paper cap with a solution of balsam of fir with chloroform, and place it gently over the wound The chloroform quickly evaporates and leaves a smooth, glossy coating of soothing balsam, which perfectly protects the pulp and holds the paper snugly in its position. The coating cannot be permeated by the muriate of zinc, and consequently bids it defiance.

If the pulp when exposed gives but little pain, there is no real necessity for using the carbolic acid, as the "solution" referred to will allay slight pain.

Having given reasons for using the balsam, let us consider the benefit derived from the use of the paper "cap." Cut from note-paper, it is smooth and of just the right thickness to be manageable, and is the best substance of the same bulk for protecting the pulp from thermal shocks that can be used.

As for the zinc, its office is purely mechanical. It simply makes a good, firm cover to the pulp, and a floor or foundation for a gold filling. Some individuals seem to imagine that oxychloride of zinc possesses some medicinal virtue that acts with magic influence upon an exposed pulp. No such thing! Despite its "antiseptic properties," it tends to irritate wherever applied, and endangers the vitality of any pulp that it touches. If a pulp can endure a coating of this substance and survive, it is a lucky member to so escape, and shows a remarkable tenacity of life.

To heal a wounded pulp, I have in several instances applied tincture of calendula, which, for a fresh wound or "cut," is one of the best remedies known.

The solution of balsam of fir is prepared by simply dissolving about half a drachm of the balsam in four drachms of chloroform.

It seems unnecessary to cite cases where exposed pulps have been successfully treated and their vitality preserved, for every intelligent and careful operator may witness them as the result of his own manipuations, if he earnestly tries. Of course I refer to healthy pulps. If from long exposure they become sickly or partly decomposed, the chances of their salvation may be considered rather slight—"deplete the system" as you will by "cathartics" or "emetics," or in any other manner that has been (by some) suggested. The more diseased the pulps, the less likely will our efforts to restore them be successful.

When exposed pulps are treated as above described, it is well to fill the entire cavity with the zinc filling, and allow it to remain so stopped several days or weeks, and perhaps in some instances for months, before cutting out the excess preparatory to introducing a more permanent stopping. It has then time to become quite hard, and offers great resistance to the pressure required to consolidate the gold.

Gutta-percha stoppings are frequently used for capping exposed pulps, but are objectionable on account of their liability to swell and crowd the pulp; also from the tendency of such material to yield to pressure when brought to bear upon it.

All things considered, the oxychloride of zinc, properly applied, undoubtedly makes the best capping for these cases; but somebody has said that the surest method of saving exposed pulps is "*not to expose them.*"

PROCEEDINGS OF DENTAL SOCIETIES.

MICHIGAN STATE DENTAL ASSOCIATION.

A MEETING of this body was held November 12th, in Jackson; Dr. George W. Stone, President.

The subject of Dental Hygiene was discussed. Dr. Thomas advised dentists to urge upon parents the duty of closer attention to their children's teeth.

Dr. Dorrance urged the same as a duty to patients, because their children's teeth often sustain fatal injury before they are even examined.

Dr. Jackson illustrated the evils of defective food.

Dr. Hayes urged the importance of teaching parents the necessity of securing scrupulous cleanliness of the teeth of children.

Small brushes and frequent rinsings of the mouth were commended by Dr. Hawxhurst.

A paper was read by Dr. G. R. Thomas on the subject of "Dental Education."

After much discussion, there was a general agreement upon the desirability of a dental department in our State University; and Drs. Hawxhurst, Robinson, and Thomas were appointed a committee to confer with the Regents of the University, relative to establishing a dental department in connection with that institution.

Dr. Hawxhurst read a paper on "Dental Chemistry," with reference to the use of phosphates as a remedy for a scanty supply of the osseous elements in food. From the expressed opinions of leading practitioners in this and other countries, he was led to infer a widespread and profound conviction:

1. That defective organization of the teeth is the great predisposing cause of decay.

2. That defective organization arises from defective nutrition, and this largely from a scanty supply of lime salts in the ingested food.

The blood is not supplied with mineral salts in quantities sufficient to support normal nutrition. As a consequence, the teeth are poorly organized, and will not resist the most feeble causes of decay. Nutrition is not wholly arrested, but is thus subjected to a long-continued disturbance, which, though permitting a sort of stunted development of the teeth, nevertheless entails upon them serious molecular defects.

The question is how to supply the deficient elements of nutrition and furnish them to the impoverished blood and starved tissues in assimilable form. The opinion has been held that artificial lime salts, unvitalized by the plant, cannot be assimilated, some even pronouncing them worthless, while others believe in their assimilation. But the proofs on either side seem to be wanting. He considered the subject one of great importance, and urged the rejection of all mere authority, unsupported by fact and experiment, or the most direct and rational inference from these.

After an extended investigation as to the solubility of the chemically-prepared phosphates in the gastric juice, he believed they might thus be absorbed into the blood. He concluded in the words of the German Wibner: "The discriminating exhibition of the phosphate of lime increases incontestably the presence of the calcareous salts in the bones" and other tissues. For easy digestibility he preferred the lacto-phosphate, as prepared by Dusart and Blanch.

Dr. Hunter moved that Dr. Hawxhurst be requested to prepare for publication, and publish in book form, the valuable paper read by him before the Association; which was unanimously adopted.

The following officers of the Association were then elected: President, G. R. Thomas, of Detroit; Vice-President, B. Bannister, of Kalamazoo; Secretary, T. R. Perry, of Grand Rapids; Treasurer, E. S. Holmes, of Grand Rapids.

The following gentlemen were chosen delegates to the American Dental Association, which meets at Put-in-Bay, Ohio: C. C. Jenkins, of Ann Arbor; D. C. Hawxhurst, of Battle Creek; I. Douglass, of Romeo; G. W. Stone, of Albion.

Adjourned to meet in Detroit, on the second Tuesday in October.

NEW YORK FIFTH DISTRICT DENTAL SOCIETY.

The Fifth District Dental Society held their regular semi-annual meeting, at Rome, N. Y., December 3d, 1872.

The officers of the society are:

President.—Dr. W. W. Perkins.

Vice-President.—Dr. C. H. Chambers.

Recording Secretary.—Dr. F. D. Nellis.

Treasurer.—Dr. J. H. Bradt.

Board of Censors.—Drs. L. W. Rogers, S. B. Palmer, Charles Barnes.

The Vice-President read an essay on "Alveolar Abscess."

An obituary upon the death of one of our late members, Dr. P. Harris, of Skaneateles, was read by Dr. Barnes, after which appropriate resolutions commendatory of his character and good standing were passed.

The balance of the session was spent in discussing the following topics:

1. "The Constitutional, Structural, and Pathological Indications of the Proper Material for Filling Carious Teeth."
2. "Dr. Robert Arthur's System for the 'Treatment and Prevention of the Decay of the Teeth.'"
3. "Regulating the Teeth, with Exhibition of Models and Appliances."
4. "The Comparative Merits of the Celluloid Base, as shown in the experience of the past year."
5. "Incidents of Office Practice, including Methods and Instruments."

While the subject of regulating the teeth was up for discussion, Dr. F. D. Nellis mentioned using palm-wood, believing himself to be the first in discovering its superior qualities over every other kind of wood used for like purposes. The fact that it does not expand longitudinally makes it, in many cases, superior to rubber; that it will retain any position the operator desires it to occupy, without crowding heavily on the gums, is another gain over rubber. It will expand about one-half more than its original size, moving all before it, and with a force as great if not greater than that of rubber.

Operators will find this wood advantageous especially in regulating the teeth, where expansion of the maxilla is desired. The kind of wood used was the handle or rib of a palm-leaf fan, pairing off the outer or glossy surface, and then cutting and shaping the blocks to correspond with the space they are calculated to occupy.

F. D. Nellis, *Recording Secretary.*

THE ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The third annual meeting of this association will convene in the college building, on Friday morning, February 28th, at ten o'clock, and will be continued during Saturday, March 1st.

The annual address will be delivered by the President, Dr. A. Lawrence, of Lowell, Mass.; and several essays by prominent members of the profession will be read and discussed. Other subjects, of importance and interest to the profession, will also be presented.

Due notice of the *reunion*, together with the list of essayists and the subjects of their essays, will be given in circular form.

The members of the Association, other alumni of the college, and the profession generally are invited to attend.

The seventeenth annual commencement of the college will be held at the Academy of Music, on the evening of March 1st.

E. R. Pettit, *Secretary.*

PHILADELPHIA DENTAL COLLEGE.

The tenth annual commencement of the Philadelphia Dental College will be held at the Academy of Music, on Friday, February 28th, at 7½ o'clock P.M.

The address to the graduates will be delivered by Professor J. H. McQuillen; the valedictory of the class, by S. E. Knowles, M.D., of San Francisco.

The profession are cordially invited to be present.

The Alumni Association will meet in the college, at 10 o'clock, on the morning of the commencement. Matters of importance will be submitted, and it is the desire of the faculty that all of the alumni who can do so should attend.

J. H. McQuillen, *Dean.*

CLINICAL REPORTS.

UNIVERSITY OF PENNSYLVANIA.

SERVICE OF JAMES E. GARRETSON, M.D.,
LECTURER ON SURGICAL DISEASES OF THE MOUTH.

REPORTED BY DE FOREST WILLARD, M.D.

GENTLEMEN: It has opportunely happened to-day that a case has presented itself for treatment which will give me the desired opportunity of continuing the subject which we were discussing at our last meeting, namely,—

FRACTURES OF THE JAW.

A few months ago the patient, by a railroad collision, sustained a double compound fracture of the lower jaw, upon the right side. The treatment was perhaps pursued with ordinary care, but you will see the result. The bone being broken in two places upon one side, the intermediate fragment was necessarily rendered quite mobile from its detachment at both ends, and in the process of cure it has tilted over to such an extent that the grinding faces of the canine, bicuspids, and first molar teeth present inward toward the mouth. The deformity is so great as to interfere with mastication, and also injuriously press upon the tongue.

This is one of those cases in which necrosis of this central piece would not have been unlikely, owing to the deficiency of blood supply. Non-union is also met with as a result of some such cases.

Now, what can we do for this man's relief? Obviously nothing so long as this fragment remains in its false position. It must, then, be refractured,—an action which I forthwith proceed to accomplish, the callus being yet of but moderate strength. Now we have to treat it as an ordinary double fracture which has a tendency to displacement. Instead of wiring the teeth together, or clasping them (either of which methods are apt to cause much soreness), I shall fix them rigidly by the use of an *interdental splint.* This is a simple apparatus, and yet I have no doubt that many of you would be exceedingly puzzled in its manufacture; in fact, I would advise that, whenever practicable, you should commit the work to the neighboring dentist, since he will have not only the necessary instruments, but also the mechanical knowledge and practical experience of manipulation, which you will lack in this particular direction.

The impression of the mouth should, however, at least be taken by yourself, since from it you can order the splints from any point. The only requisites are, yellow wax and a mouth cup. These cups, of different sizes, are in the hands of every dentist; but if you cannot procure them, one may be improvised from a simple flat shingle, or a piece of tin properly bent. The wax is softened by the fire, and thoroughly worked, when it is placed in the tray, and the apparatus carried into the mouth Care should be taken that the fracture is accurately adjusted, and then the wax is firmly but gently pressed into position over the teeth and around the gums. This should be done carefully and thoroughly, so that every irregularity may be reproduced, and the alveolar process accurately modeled.

The tray should not be rocked or moved, but the fingers of the operator are to pass over every part, especially about the gums, on both lingual and buccal aspects.

A few moments are given for the wax to harden, after which it is carefully and gently removed; a little difficulty from suction will show that a good impression has been secured. Care should be taken, before this impression is made, that the fragments are in good position, and that the mouth be thoroughly cleared of saliva and mucus, by rinsing with a little cologne and water. If you should become an expert at this process of manipulating the wax, it might happen that some difficulty would be experienced in removing the cast without injury, on account of strong suction. In such an event, a small cord introduced into the mouth with the wax, would, by its withdrawal, permit sufficient entrance of air to obviate the difficulty. A wax cast when removed from the mouth soon hardens in the surrounding atmosphere.

Plaster of Paris, if more convenient, may be used in place of wax. It must be finely pulverized, and then made with water into a paste of such consistence that it will not easily run, and yet be soft and pliable. The paste is placed in the tray as in the case of wax, care being taken that none of it slip down the patient's throat during the operation. The tray is carefully pressed into position, and allowed to remain until the plaster hardens,—a fact which can be determined by nipping off small pieces from time to time,—usually about three or four minutes. It must not be removed too quickly, else the cast will be ruined; neither should it remain too long, otherwise it will become too hard, and may injure the mucous membrane. The process of setting may be facilitated by the previous introduction into the plaster of a little common salt, or else sulphate of potash. It may be convenient to use a tray with a false flange, which can be easily removed, and thus permit the ready separation of the tray from the cast by an inserted knife-point.

The tray being removed, the plaster cast is broken into fragments, each piece being carefully preserved for coaptation. Occasionally you may be able to take away a cast without thus fracturing it.

Gutta-percha, softened so as to be used as wax, has been employed for taking impressions, but it has the disadvantage of being difficult in manipulation. It may sometimes be mixed with wax, and gives a cast with remarkably well-defined lines.

We will now suppose that the impression is taken, perfect, if in wax; in carefully preserved pieces, if in plaster. This is now to be sent to the dentist, who will be able to do the remaining work far easier and cheaper than you yourself can.

He will then proceed to make a plaster model,—a "positive" from this "negative,"—which will give the exact fac-simile of the mouth itself. His next step will be the manufacture of the dies, which he will make by packing the model in sand in order to form a mould, then removing it and filling its place with melted zinc. This hardened, the lead or female die will be cast in a somewhat similar manner. The dies will be made, of course, for both upper and lower jaw. These ready, he has but to fashion and strike the plate, in silver or gold, between these dies, which, when filed and fitted, will make accurate and exact caps for any of the teeth desired to be covered.

In the case before us we need not confine the entire arch, since this is clumsy for the patient, and also interferes with the taking of food. At this stage of the manufacture, the apparatus should be returned to you, if convenient, when you will place it in the mouth and decide upon what portions may be cut away, or preferably you may have previously made up your mind upon this point, and have informed the dentist as to the particular portions of the model which are to be fitted. In this case we shall make the upper plate as one, to cover the roof of the mouth and all the teeth save the incisors,—the plate being fitted only to the palatine faces of the latter; the lower plate will cap the canines, bicuspidati, and molars of either side, the plates being separate and independent upon the two sides.

At this stage the plates are to be tried in position. The fractured portion will be held in its place while the plates are inserted and the jaws firmly closed upon them. With wax you will now (having seen that all is right) fasten the lower two pieces to the upper one, and then carefully remove the apparatus from the mouth as a mass, without disturbing the union which you have secured. Again is it to be returned to the dentist, with instructions to solder the plates together in precisely the position to each other which they now occupy. This done, do you not see that you have an accurate model of the teeth and gums which must hold everything firmly just so long as the teeth are kept in the caps?—a fixation which is easily secured by the application of a Barton or Gibson bandage, or the sling of my own, of which I spoke to you at our last meeting. The central portions being cut away, the man will have no difficulty in taking liquid nourishment, and the apparatus is so slight and delicate that it will be scarcely noticeable. It must remain in position four, five, or six weeks, according to the nature of the case. Cleanliness may be secured without removal by frequent syringing and washings beneath the plates, and around them; the compound tincture of iodine or compound tincture of capsicum, properly diluted, being used when there is any discharge which is offensive: a condition which will occur, especially in necrosis.

When the fracture is multiple and the fragments small, necrosis is quite common, and in the upper jaw it may be said to be almost the rule. When portions are found to be dead, they should be removed as fast as they separate. When the upper jaw is broken, which usually occurs from crushing forces, the only treatment is to mould the parts into position, and make the lower maxilla the splint; or else fastening all the pieces by a splint plate such as I have just shown you.

These plates are as effective as are the more complicated contrivances of Dr. Gunning, although his are certainly very ingenious, and in some cases will undoubtedly be of greater service than these suggested. When you have a case which gives you much trouble, I would advise you to study his monograph, from which you will derive many valuable hints. Dr. Beans, of Georgia, has also done service by his suggestions in this direction.

[The case progressed satisfactorily, no complication occurring save the necrosing of a few small fragments of the callus, and in five or six weeks the patient was discharged well.—De F. W.]

EDITORIAL.

THE RELATIONS OF DENTISTRY TO MEDICINE.

A correspondent, renewing his subscription to the Dental Cosmos, writes: "Try and let us have more dentistry and less medicine." "Do you ever read the Dental Cosmos?" said one physician to another, in the hearing of the writer, a few days since. "No," was the reply; "it takes all my spare time to keep posted in medicine." In both these remarks is evinced the false conception,—shared, unfortunately, by large numbers in both professions,—that there is a dividing line so separating dentistry from medicine that the practitioner of either profession may afford to ignore all that belongs to the circle of the other. The mistake of both alike is in the assumption that an arbitrary division in a chain of physiological and pathological action is possible.

A recent writer has truthfully remarked, in substance, that in no department of medical science has there existed such a hiatus as yawns between the professions of general medicine and surgery and that of dentistry,—a missing span in the bridge of practice. A patient, trusting a complex oral disease to the average dentist, fails because of the absence of surgical knowledge and skill; approaching from the side of medicine, he fails by reason of a corresponding deficiency, as common and as unjustifiable, in the general medical practitioner.

We have heretofore insisted that conservative dentistry must necessarily be based on an appreciation of the anatomical, physiological, and pathological relations of the mouth and of the institutes of medicine. We insist with equal earnestness that these relations must be comprehended by the physician; and yet it must be apparent to all that there is a deplorable want of information in this direction on the part of a majority of general practitioners.

Until the importance of this knowledge is more fully appreciated by both classes, the community will fail to receive the benefit from either which they have a right to expect.

To be impressed with the necessity which these propositions indicate, one has only to remember the various important anatomical and physiological functions of the mouth: its physical, organic, and mental associations, and the corresponding extent of its pathological relations.

The medium of aeration and alimentation, the organ of mastication and insalivation, of speech and of music, it is thus intimately related to the entire system. Its varied offices necessitate a no less varied structure, and an equally varied anatomical relation with other structures. It is thus liable in pathological conditions to affect and be affected by remote as well as contiguous organs.

Anatomically, no portion of the human economy offers a more complex association of structures; physiologically, none whose functions are so diversified, and yet so essential; pathologically, none whose systemic relations are more significant.

A consideration of the pathological relations of the mouth includes radiated, reflex, or sympathetic disturbance of harmony, or interference with function in contiguous or remote organs, originating in the mouth, and as well the expression in the oral cavity of lesions or interruption of harmony in other organs. Morbid systemic or constitutional conditions, whether the result of some immediate primary affection, or of inherited tendency or perversion, find usually a more or less strongly pronounced expression in the mouth.

The origin of most local diseases and abnormities, in the mouth or elsewhere, it may be assumed, is directly or indirectly dependent, if not traceable, to a systemic cause inherited or acquired. Perhaps in no portion of the economy is this illustrated so frequently, so variously, or so forcibly as in the oral cavity.

If in the blood reside the elements of nutrition, and if the quality of the blood depends primarily upon the pabulum furnished, it is evident that if food defective in quality or deficient in quantity be supplied to the mother during gestation, the result must be the imperfect organization of the teeth as well as of the other tissues. So, if during lactation the food of the nurse be wanting in the materials of osseous structure, a deficiency in the nutrition of the dental organs will ensue.

The physical characteristics of the teeth, considered individually, or relatively to each other and to the maxillary arch, give striking exemplification of hereditary transmission, and of impressions made upon them during their formative stage. This is illustrated in the reproduction in the children of dental anomalies in the parents, and also in the constant tendency which the teeth exhibit to decay in pairs. The abnormities, harelip and cleft palate, serve to illustrate a class of hereditary or congenital defects dependent upon defective or interrupted nutrition. The delayed, irregular, and painful dentition of rachitic children, and the imperfect character of their teeth, is a prominent expression of this peculiar cachexia.

In those differences existing between individuals which are designated as temperaments, as also in the peculiar predispositions termed diatheses, no single sign is more significant than is to be found in the physical character of the teeth,—their size, shape, color, density, and alignment being as much an index of the various temperaments and diatheses as is the distinctive complexion, the color of the hair, eyes, etc.

There is a law of correlation running throughout the organism, which establishes a harmony between the teeth and other physical characteristics, by which we are led to infer not only their size, shape, and structure, but to estimate their resisting power and ability of repair. In other words, there is a constituent difference, in harmony with the constitutional organization. There is also a marked structural distinction, consistent with the service required of them, between the teeth of the first and second dentition: a gradual absorption of the roots of the deciduous preparatory to the eruption of the permanent teeth, and a modification in the proportions of the constituents of the permanent teeth, and in the tendency of their roots to atrophy in advancing age, which demonstrates physiological and pathological sympathies with the entire organism.

In the several temperaments, the difference in the physical character of the teeth is also shown in their varied liability to decay, the character and progress of the decay varying also not less than does the original structure, the inherent liability being, however, modified by systemic conditions. There seems to be in some families a progressive physical degeneration, resulting in the cachexia of debility, marked by certain anomalies of dentition, such as proportional inharmonies in shape, relative size, and in alignment of the teeth, a twisting on their long axes, etc. And not only is there a correlation between physical and dental organization: there is also a relation between dental and mental deviations.

But health in the dental organism and associate structures depends not alone on circumstances associated with the original formation and predisposition, but also on constitutional conditions. Cachexiæ are not invariably dependent upon congenital predisposition, but may be determined by extrinsic morbific influences, and sometimes in directions absolutely opposite to hereditary tendency; but the conditions, whether inherited or acquired, have generally distinguishing records, and sometimes their most pronounced expression, in the mouth.

Inherited tuberculosis, scrofulosis, and syphilis have sure pathognomonic indications in the teeth. The temporary interruption of nutrition by acute infantile epidemic diseases is manifested distinctively upon the dental organs. Pregnancy, dyspepsia, rheumatism, and gout not only express disturbance of systemic harmony by painful sensations located in or referred to the teeth, but exert a morbid influence on them by virtue of the vitiated secretions to which they give rise.

That congenital impressions are indelibly stamped in the physical characteristics of the teeth, and that systemic conditions are manifested, is thus shown; and the illustrations might be multiplied indefinitely. No less striking, however, is the converse relation,—the systemic disturbances due to causes existing in the oral cavity. The varied and grave derangements fairly attributable to the irritation of the first dentition are too well known to need recapitulation; and there is overwhelming evidence of a frightful variety of serious local and systemic affections having their sole origin in dental lesions.

But, notwithstanding the constantly-increasing records of these pathological relations, physicians and dentists are still laboring to correct the multiform manifestations thereof, each in his own sphere, as they choose to consider it. The dentist is not supposed to know anything of the systemic condition of his patient; indeed, not presumed to have any right to *meddle* in this direction; while the physician rather complacently ignores the importance of the local lesions which it is esteemed the province of the dentist to correct, if indeed he does not rather pride himself on forgetting all he ever knew about such matters.

Meantime, the patient chafes at the incompetency of the dentist who fails to arrest by mechanical skill the ravages of caries, and perhaps the operator himself fails to recognize in the lesions the expression of systemic mischief. On the other hand, the physician, ignoring local causes, tries in vain spectacles and pessaries, pills and plasters, blisters and purgatives; tries in vain the whole round of narcotics, sedatives, stimulants, tonics, antispasmodics, and antiperiodics; tries, also, in vain, electricity, Turkish baths, and travel, talking learnedly of neuroses and cachexiæ, until pharmacopœia, patience, and patient are alike exhausted.

These being undeniable facts, and the cases illustrating them being neither few nor far between, the necessity for a better appreciation of these pathological relations, both by dentists and physicians, need not be argued. More familiarity with what has been considered the dentist's province by the physician, and a wider range of knowledge by the dentist, are imperatively demanded.

The methods by which the results indicated are to be reached it is not the purpose of this article to discuss, but the "missing span in the bridge of practice" must be well and securely set in place. The community, rapidly attaining the ability to recognize and the readiness to question, will soon be dissatisfied with a practitioner, general or special, who manifests ignorance of this physiological and pathological circle, and the surgical and therapeutic indications.

It does not follow that a better comprehension of these relations and their significance by the physician will necessitate operative skill, any more than a like appreciation by the dentist will relieve him of the necessity for the highest manipulative ability, or compel him to general practice; but the dentist should be competent and quick to diagnose systemic causes of local lesions, and the physician to diagnose the local causes of systemic inharmony; and the professions will respect each the other as they recognize that, standing on a common platform, and with common honors, they divide into specialties but for the common good, and that greater skill may be acquired by limiting the field of special practice.

CORRESPONDENCE.

LONDON, Dec. 18th, 1872.

I CONCLUDED my last letter with a brief reference to the case of Mr. Grant, of Jersey, who was then awaiting his trial on a charge of indecently assaulting a patient to whom he had administered an anæsthetic. The trial came off on November 10th, and resulted in the acquittal of Mr. Grant. For the defense, it was sought to prove that erotic delusions are among the very common effects, in some subjects, of both chloroform and nitrous oxide, and that supposing the prosecutrix's story was to be believed, she had been laboring under a delusion of this sort. Medical evidence was called to support this view. Happily, however, for the accused, the case for the prosecution signally failed, and the jury, besides a formal verdict of not guilty, declared their belief in the innocence of Mr. Grant.

At the last two meetings of the Odontological Society, on November 4th and December 2d, several subjects of considerable interest and importance were brought forward. At the November meeting, the second report of the committee who were appointed to examine and experiment with nitrous oxide gas was read. An excellent summary of this able and elaborate report was published in the London medical papers of the following Saturday, and as these will have already reached you I need hardly now repeat this. Suffice it to say, that the committee gave nitrous oxide the highest place among anæsthetics for safety. There have been placed in their hands records of fifty thousand administrations in this country by members of the Odontological Society. In addition to this, it must have been given twice that number of trials by others—there are hosts giving it—who have not communicated with the committee. We may therefore safely infer that the gas has been imparted more than one hundred thousand times without a fatal result, for no coroner's inquest has been held on a death from this anæsthetic, and it would be impossible to avoid such an inquiry had a fatal casualty occurred.

At the December meeting of the Society the discussion of the report took place. Mr. Arthur Norton, who had performed elaborate experiments on the lower animals, in order to investigate the physiological action of the gas, said that it acted as a deception upon the lungs, the muscles having their full power of action, but the blood changes of respiration not being affected. In other words, it was a process of painless asphyxiation. Although he admitted that the patient was asphyxiated, yet he proved that the gas possessed special anæsthetic power, and the insensibility was not altogether due to apnœa. He did not think the gas suited to long operations. Mr. Coleman said he had given it successfully in protracted operations,—one amputation of the thigh by Sir James Paget. Mr. Bailey said that he had kept a patient under gas for twenty minutes, while a breast was amputated. Other speakers gave similar testimony. The plan adopted for keeping up the anæsthesia was to allow the patient to breathe atmospheric air at intervals, reapplying the inhaler as sensibility showed itself. Mr. Sewell, who had been engaged with Mr. Norton in his experiments, agreed with that gentleman, and hoped to be enabled to discover a mode of rendering the anæsthetic properties of the gas available without the symptoms of apnœa. I may add that the report of the committee is an exceedingly scientific and able document, and deserves the careful attention of all who are interested in the subject.

At the same meeting Mr. Oakley Coles brought forward a plan for treating exposed and inflamed or gangrenous pulps. Since last February he had been using with very satisfactory results the *Pepsina Porci.* The pepsin is made into a paste with diluted hydrochloric acid (acid, 2 per cent.), and applied to the pulp, the cavity being sealed up with cement in the usual way. The application was left for three days, by which time the dead tissue was found digested, and the healthy remains of the pulp left intact.

Perhaps the most valuable contribution to dental science which I have to record (since the date of my last letter) is a paper by Mr. C. S. Tomes, in the November number of the *Monthly Review of Dental*

Surgery, on "The Nature of Cuticula Dentis (Nasmyth's membrane)." He demonstrates that this membrane is continuous with and a modification of the cementum which covers the roots of the teeth. It is homologous with the coronal cementum of herbivora.

I told you in my last that Mr. C. S. Tomes was at work on a second edition of his father's "System of Dental Surgery." A French and a German version are to pass through the press at the same time. A new edition of "Makins's Manual of Metallurgy" is also announced.

Fletcher, of Warrington, advertises a new white plastic filling, which, he states, is much superior to any in use, and he expresses the confident belief that it will eventually supersede gold, as being equally durable. He invites the profession to try the simple experiment of submitting the ordinary osteo-plastic fillings and his new material to the action of strong acid, and noting the superiority of his invention. No doubt his challenge will promptly be accepted.

Mr. Hele, of Carlisle, describes, in the *Monthly Review* for December, an exceedingly ingenious case-mallet, capable of being used with Dr. Louis Jack's matrix pluggers. To make this instrument understood would require the reproduction of the diagrams which accompany Mr. Hele's paper.

Mr. Alfred Coleman, F.R.C.S., dentist to St. Bartholomew's Hospital, contributes a thoughtful paper on "The Degeneracy of the Teeth" to the "reports" of that hospital for the present year. He attributes the inferiority of the teeth of the present compared with that of former generations to progressive mal-development of the whole masticatory apparatus. The jaws and teeth are not worked hard enough, and therefore, like all other organs similarly situated, they deteriorate. The paper, which is addressed mainly to the medical profession, examines at length the various means to be adopted to prevent decay of the teeth by constitutional treatment and hygiene. He speaks favorably of the free extraction of the first permanent molars to relieve crowding,—a constant cause of decay.

Although but a few weeks have elapsed since my last letter, I find I could still fill for you some more pages of the DENTAL COSMOS in dilating upon English dental topics of real interest. I am afraid, however, this letter is already too long, and I must content myself, in conclusion, by expressing to you and your readers the compliments of the approaching festive season.

PERISCOPE.

American Odontological Associations.—The reports of the meetings of the dental associations of the United States, given in the last two numbers of the Dental Cosmos, form a subject well worthy of careful consideration.

Whether we have regard to the number of the societies themselves or the subjects treated of and brought forward for discussion, we find a state of mental activity among the members of the dental profession in America, for the evidence of which we should look in vain in any country this side the Atlantic. Many of these meetings were the annual sessions of the societies, while others were the ordinary periodical gatherings; but we may form some idea of the zeal with which the study and progress of dental surgery is carried forward, from the fact that, at five meetings alone, no less than thirty-four papers or technical reports on important subjects were produced and discussed; if in addition to these we note the number of clinics given by various members on some special mode of practice, we realize something of the amount of work done by our American brethren outside their ordinary private practice.

To this frequent contact of mind with mind we must surely attribute much of that inventive faculty which to every European is so surprising; for while of necessity it begets invention, it does that which is infinitely more valuable, trains the intellect to receive readily, and try without prejudice, the inventions of others; and further, as each individual can be the introducer of but comparatively few novelties, by having the temperament induced of willingness to try everything brought under notice, he is at once able to avail himself of the intellectual advances of the entire body of fellow-workers in his profession.

It is impossible to over-estimate the influence of this special mental training of American citizens, and the effects are steadily acting upon ourselves in the old country; for the fact is well known among English patent agents, that a really good invention has more chance of succeeding in New York than anywhere else; after this it may be received and adopted by ourselves, as another sample of American ingenuity, while the originator has been an Englishman, and never left his native city.

There are, of course, many points in the constitution and conduct of the American dental associations, which appear to us singular and uncongenial; but they have accomplished a great work, that is but little advanced in this country, namely, the faculty and disposition to examine impartially every new idea. One feature calls for special attention, that is, the appointment of sub-committees for each department of dental science, whose business it is to prepare reports of all novelties whether of theory or practice, in each of the several branches committed to their charge.

The formation of a British dental association, alike in purpose to the similar body of general medical practitioners, is a subject that must soon come up for consideration, and its advent will assuredly not be delayed by a careful examination of the good effected by kindred bodies of our professional brethren in the United States.—*Editorial in Monthly Review of Dental Surgery.*

Specialties in Medicine.—It is not a very long time since it was the general opinion of the profession that a "specialist," if not a quack, was a good imitation of one. Within ten years, indeed, a committee of the American Medical Association solemnly presented to that body a report adverse to the practicing of specialties. We have not that report at hand, but we know that it met the approval of many men of great good sense and of no narrow views.

And yet the "inexorable logic of events," the constantly increasing practice and influence of specialties, is, it cannot be denied, settling this question in just the opposite way. A few words will show why this is, and how any tendency to evil in this quarter is to be averted.

In the remoter country districts, in small villages, and even in towns of some size, the "doctor" attends alike to labor-cases, fractures, dentistry, fevers,—all the ailments of the neighborhood. Under this system, one scarcely knows whether to wonder more at the ability and skill which some of these hard-worked brethren develop, or at the needless waste of precious life which the stupidity and ignorance of others do occasionally involve.

As population increases, in larger towns and in cities, and with it the number of physicians, there are certain men who deservedly acquire a reputation for skill in certain cases, and about whom practice crystallizes, as it were, in these special lines. Success in surgery legitimately brings other surgical patients; in midwifery, other obstetric cases; and so on. All this is clear; and now, when we consider the vast advances of modern science, and the wide range of reading necessary to keep pace with the literature of any one branch of practical medicine, is it not obviously for the benefit both of the profession and of the people that each workman should have a chance to thoroughly cultivate a smaller field, rather than to cover more ground less effectively?

We contend that so long as a complete medical education is required of every graduate—a thorough foundation upon which the study of any special branch may be based—advantage only can arise from the subsequent partition of the field of labor. Such a system would by no means tend to produce surgeons who could not recognize pneumonia, or physicians who could not detect an ordinary fracture: it would not develop *narrowly*, but *highly* cultivated men. This universality of education is the great safeguard, and will always keep the scientific specialist distinct from the quack.—*Editorial in Philadelphia Medical Times.*

Facial Neuralgia with Unilateral Sweating.—Mary Ranchen, aged forty-five, applied at University College Hospital on April 26th. Her father died of rheumatic fever; her mother in her third attack of apoplexy, and eight of her mother's sisters of "apoplexy" at the age of twenty-four or twenty-five. One sister died of dropsy, another of paralysis, a brother of convulsions when a few months old. One brother is a healthy man. She has a son aged sixteen and a daughter thirteen, both healthy, and who never suffered from convulsions. At her last confinement she had twins, who died immediately after their birth. Five years ago the patient was seized with hemiplegia of the left side, affecting the face as well as the arm and leg. The face soon recovered, but the leg did not recover for two years. The arm recovered before the leg. The catamenia ceased about a year ago.

She has felt a little pricking pain on the right side of the face for two months, and meanwhile had suffered from unilateral sweating of the right side, and has passed a large quantity of water, to the extent, she says, of six pints a day, and complains of distressing thirst. Unfortunately, we could not get any of her urine to search for sugar.

About eight days ago the right nostril began to run freely, and on the 23d (three days ago) the right eye began to water, and in a few hours she was seized with a very severe pricking pain of the right side of the face. The pain has recurred three times daily—in the morning, afternoon and evening—each paroxysm lasting about two hours. She describes the pain as being most severe, and compares it to pricking every part of the skin with a red-hot needle. The pain corresponds to the distribution of the supra-orbital, infra-orbital, and inferior dental branches of the right fifth. The pain reaches exactly the middle line of the nose, but not quite to the middle line of the upper and lower lips. On April 24th, the second day of her illness, the right side of her face became greatly swollen, the swelling increasing with each paroxysm, and decreasing shortly afterwards. On the 25th she felt pricking pain inside her nose. On her first visit (26th) the right side of her face was very red and greatly swollen, so that she opened the eye with difficulty. The right eye was greatly injected, and exposure to the light produced great pain. There was great lachrymation, and its vision was greatly impaired. There was a little swelling on the left side, in the neighborhood of the infra-orbital foramen. The pain which has been described was most severe, and was limited to the right side, the swelling of the left side of the face being free from pain. She complained of severe pricking pain in the right eye-ball. The motor branch of the fifth was unaffected. Hearing and taste were natural. The pupils were much contracted, but equal. There was no ptosis, no strabismus, nor paralysis of the seventh or ninth nerves. The right side of her mouth seemed dry to her, although on the left side there appeared to be excess of saliva. After the attack of paralysis she suffered for some time from cold feet; but gradually this symptom got better, but returned with the present attack. The right extremity is very cold as high as the knee, and is colder than the left. The right is so cold that it wakes her, and she is obliged to put on a thick woolen sock and use a warm bottle. The unilateral sweating on the right side reaches only as low as the knee.

On the day of her first visit we painted the right side of her face with aconite liniment, and on the following day (April 27th) we found that the pricking pain was very much less severe and more limited, and the right eye was much less bloodshot, less painful, and she could see distinctly. The running at the right nostril was greatly lessened, but the excess of sweating on the right side was undiminished. The aconite liniment gave her sharp pain like that of a drawing blister, and made the skin quite numb.

On the 29th she stated that, on leaving on the 27th, slight pricking pain returned under her right eye, but on applying the liniment lightly the pain, in ten minutes, disappeared. In the afternoon she experienced slight pricking along the right lower jaw, but the liniment, lightly applied, removed it immediately, and ever since she has been free from pain. To-day (29th) there is no swelling of her face, the right eye is very little bloodshot and the sight is perfect. She perspires much less, and the sweating of the two sides is equalized. On the first day after the application of the aconite liniment her feet became warm, and have not since been cold.—*Sydney Ringer, M.D., in The Practitioner.*

Phosphorus in Neuralgia.—Sir:—Phosphorus is a remedy little, if at all, employed by the regular practitioner in cases of neuralgia, though I believe frequently exhibited by the homœopath. A case, however, came under my notice some time since which so strikingly illustrated its value as to induce me to record it.

A gentleman, who had for years suffered acute and frequently recurring paroxysms of neuralgia of the chest walls, applied to me for advice. I found that he had been a regular round of London and provincial doctors, and that every plan and remedy appeared to have been tried,—from the hyssop on the wall, in the shape of quinine, to the cedar of Lebanon, in the form of Pulvermacher's chains and heroic doses of arsenic. Suffice it to say that I failed as signally as my predecessors in affording him anything but temporary relief, and, under the circumstances, could not repine at his seeking aid from the homœopath. My surprise, however, was considerable in finding that the ease for which he had so long sought, and sought in vain, was procured in a very brief space of time by this change of doctors. "Happy are they that can hear their detractions, and put them to mending." I lost no time in ascertaining the remedy which had worked so speedy, and, as it proved in the sequel, so permanent a cure, and found that it consisted of the so-called mother tincture of phosphorus, of which he was ordered to take five drops on the advent of an attack, and repeat them as occasion required.

This tincture of phosphorus is a solution of phosphorus in ether, which dissolves about one per cent., so that each dose contained about one-twentieth of a grain of phosphorus,—scarcely homœopathic according to the old-fashioned notions; *mais cela va sans dire.*

Not only was the pain relieved, but the frequency of the attacks was lessened, until from suffering a seizure two or three times a week, as he had for some years, he has now been entirely free for more than four months.

Since the occurrence of this case I have frequently employed this preparation of phosphorus, and have often found it of signal service in curing neuralgia; especially, it has appeared to me, in those subjects who add to a highly nervous temperament some cause of nervous waste; so that I have considered it probable that the neuralgia has, indeed, in these cases been, as Romberg styled it, "the cry of the hungry nerve for blood," or, rather, for its own special pabulum in the blood, and that the phosphorus has directly supplied this want. I have also employed pills of phosphorus melted in suet, and coated with gelatine, a preparation recommended by Squire when phosphorus is indicated; but I have not found them to possess any advantage over the phosphoric ether, while they possess the disadvantage of being difficult of preparation, and the universal pillular drawback of doubtfulness of destination, whether of absorption into the blood or of excretion by the bowels.—*S. M. Bradley, in Lancet.*

Croton Chloral in Painful Affections of the Fifth Nerve.—It is perhaps surprising that a remedy whose action was several months ago declared to be of so extraordinary a character should have received so little attention at the hands of the profession, especially when this new medicine promised to be so efficient a weapon against some of the most painful diseases known to physicians. Beyond one or two pharmacological notices, the substance seems to have been altogether passed by.

The hydrate of croton chloral was made by Krämer and Pinner, by the action of alkalies upon dichlorallyl and formic acid. Its physiological action was investigated by O. Liebreich. He found that in animals it produced a deep anæsthesia of the head, without any loss of sensibility of the body. Death was caused by a paralysis of the medulla oblongata. In man, an anæsthesia of the fifth only was noticed. The sensibility of the trunk, and the pulse and respiration, remained unaltered.

Having procured some of this substance, I determined to make observations upon such of my patients at St. Bartholomew's as appeared likely to be benefited by the use of the medicine. I gave it to about twenty persons, nearly all women. They varied in age from seventeen to forty-four. They were all suffering pains in the regions supplied by the fifth nerve,—that is, the upper and lower jaw, the face, and the supra-orbital region of the forehead. The pains were paroxysmal. In the majority of the cases they were increased at night. In nearly every one of these cases there was caries of the teeth. In about half there were signs of anæmia. The medicine was given in doses of five, ten, and twenty grains, dissolved in water. It was given at night, just before going to bed. In one case, where the pains became aggravated at noon and at bedtime, it was given just before the increase of pain was expected. In all the patients, except two, great relief from pain followed the dose of croton chloral. Some of the patients said that they slept well after it; others, that they did not sleep, but that the pains in the head and face either ceased altogether, or were much diminished. In two cases, both women, the croton chloral was of no use whatever, the pains being aggravated during the use of the medicine; but in the rest of the cases more or less relief was given.

Should the croton chloral be as efficient in the hands of others as it has been in mine, it will prove a most important addition to the materia medica. It will enable the physician to give relief from pain until relief can be afforded by the dentist, or by attention to the general health, and this without any of the general effects of narcotics. It is almost unnecessary to dwell further upon the advantage of possessing such a means.—*Dr. J. W. Legg; Lancet.*

A New Means of Relieving Toothache.—This remedy consists in the employment of injections introduced into the gum near the diseased tooth. Dr. Dop has tried these injections in about one hundred cases. In twenty cases he made use of morphia, which succeeded very well, but only for a time. Chloroform was far more successful, and is now exclusively used by Dr. Dop. It was eminently successful in sixty-two cases out of eighty. The injection is made with the small syringe commonly used in France for subcutaneous injections. Only two drops are put in at a time. The needle is introduced gradually, and must remain *in situ* a few seconds. On withdrawing it, pressure must be exerted on the gum with the finger. In by far the greater number of cases one injection is quite enough to stop the toothache.

In some instances a second injection is needed twenty-four hours after the first. During absence of pain the tooth may be plugged, or dressed with creasote, etc.—*Revue Médicale de Toulouse.*

TREATMENT OF TIC-DOULOUREUX BY ICE.—In the *Mitt. des Aerztl. Vereins in Wien*, No. 7, 1872 (*Phil. Med. Times*), W. Wentteritz relates a very stubborn case of facial neuralgia in a lady, which had not yielded to any of the means applied. A smooth piece of ice was stroked gently over the affected side of the face every five minutes. The painfulness of the application was lessened by holding some alcoholic fluid in the mouth until a slight feeling of warmth was excited. The pain, which disappeared in twelve hours under this treatment, had not returned ten months subsequently.—*British Medical Journal.*

MEDICINAL PROPERTIES OF THE BROMIDE OF POTASSIUM.—Prof. See, in one of his last lectures at the School of Medicine, expatiated upon the medicinal properties of the bromide of potassium,—a drug so much in vogue, and yet so little understood. He said it was often prescribed in a most reckless manner, and administered with substances not only chemically incompatible with it, but whose therapeutic action is diametrically opposed to it. For instance, it is frequently ordered with, or as a substitute for, the iodide of potassium, and *vice versa*, and there is a prescription in Bouchardat's "Formulaire" which bears the name of a celebrated physician, containing these two salts in combination with the chloride of sodium and butter, which was to be eaten with bread as a substitute for cod-liver oil. The bromide of potassium acts specially as a sedative on the vascular and nervous systems, whereas the iodide is purely an alterative, operating on the general processes of nutrition and elimination. The bromide of potassium is essentially a vascular remedy. It is probable that through the nerves it acts on the muscular coats of the vessels, causing permanent contraction of the latter and consequent anæmia of the organs, a condition opposed to that produced by belladonna. It acts indirectly as a sedative on the heart, which it may stop, but only when given in enormous doses. As a soporific or narcotic it is preferable to opium, particularly in children, as it does not produce headache or the other inconveniences of the latter. Its double action, as vascular and as a nervous hyposthenisant, renders it a most invaluable agent in all cases of neurosis accompanied with congestion of the nervous centers.—*Medical Times and Gazette.*

THE MONOBROMIDE OF CAMPHOR.—Dr. W. A. Hammond has used this new preparation—consisting of one equivalent of camphor with one of bromine ($C_{10}H_{16}O$, Br.)—with marked success in infantile convulsions due to the irritation of teething. His experience in this difficulty is limited to two cases. "In each, a grain was given hourly, rubbed up with a little mucilage of acacia. Three doses were sufficient in one, and two in the other case. The children were aged respectively fifteen and eighteen months."—*Chicago Med. Jour.*

METHOD OF ADMINISTERING CHLOROFORM.—A writer in the *Australian Medical Gazette* advocates the inhalation of chloroform by pouring about thirty drops of the article on a handkerchief, breathing it in for a few seconds gently, and then as forcibly as possible.

He thinks this method perfectly safe,—which remains to be proved, as he adduces only four cases, though he claims to have had others in which it had been used by him. [It seems to us much like Simpson's plan of pouring the chloroform, drop by drop, on a single layer of thin stuff placed over the mouth: and a friend assures us that he has seen death occur when this was used.]—*Phil. Medical Times.*

ICE TO THE NECK IN HYSTERIA AND SUSPENDED RESPIRATION.—In March, 1872, I was requested by a dental friend to administer an anæsthetic to a patient, for the purpose of extracting a number of teeth. Notwithstanding the dread of the patient in regard to inhalation of chloroform or ether, caused by supposed cardiac and pulmonary trouble (a dread in which I did not share), I discovered on actual trial that she evinced a remarkable toleration of it, so much so that an unusually large quantity was required to produce complete anæsthesia. The teeth were extracted, and while we were awaiting a return of consciousness hysterical symptoms manifested themselves. These culminated in one prolonged, terrific fit of hysterical noisiness. For fully an hour the patient screamed, so loudly as to set at rest any lingering doubt as to the healthy condition of her lungs. The usual restoratives were vigorously plied. Antispasmodics in turn failed. Within convenient reach from the window lay some snow. I made a snow-ball of it, and on applying it to the forehead obtained some remission in the screams of the patient; but after a faithful trial I found her still unrestored, and still noisy enough to disturb the neighborhood.

I then tried the same remedy to the neck along the line of the sterno-cleido-mastoid muscle. Within a minute she gave a deep sigh, opened her eyes, looked rational, and the hysteria showed evident signs of vanishing, as it did very soon after.

In September of the same year I was called to see a nervous, delicately-organized woman, who had, on the death of her child, fallen upon the floor in a paroxysm of hysteria. When I reached the house I found her still lying where she had fallen, insensible, and in a state of clonic spasm, which closely simulated poisoning from strychnia. Mustard was freely applied to the wrists and ankles, and as much bromide of potassium given as could be forced, in concentrated solution, between her firmly-locked jaws. These remedies, on which I have learned to rely in like cases, seemed to fail me utterly here, after a fair, persistent trial. I then applied a lump of ice to either side of the neck, stroking it up and down lightly in the same line as I had the snow-ball in the previous case. Again I obtained a deep, satisfactory sigh within a minute. So long as I allowed her to remain without the ice-application, or applied it to the forehead or face, she ceased to take full inspirations, and went back into spasm. On applying it again, and maintaining its action, the sighs followed, and with them came relaxation of spasm and easy breathing, which within an hour terminated comfortably in consciousness. From what I afterwards learned of this same person, I found that she was in the habit of having these hysterical paroxysms, and also that they never before had terminated so soon as did this one.

Within two weeks of the above case I administered a mixture of chloroform and ether to a plethoric lady. The anæsthetic was pushed to the point of marked stertorous breathing. Her return to consciousness was so slow as to alarm her friends, and I was urged to "do something." I applied the ice as in the preceding case, and almost instantly the same sigh followed. Keeping up the ice to the neck, she awoke in an unexpectedly short time, considering how profoundly she had been under the influence of the anæsthetic.

These cases are simply three from quite a number I could give. They are sufficient, however, for my purpose.

Now, how did the remedy act? Certainly not by mere pressure upon the blood-vessels; for it was quite too lightly applied to influence in any way the quantity of blood in the brain. Nor yet by mere pressure upon the nerves of the part; for Waller, page 193 et seq., vol. ii. of *The Practitioner* (English), has proved in a highly suggestive article that pressure there, affecting the nerves, is followed by a *heaving respiration, but also by syncope*, of which latter there were no symptoms save a muscular relaxation, which was natural in any condition of rest.

To my mind the most probable explanation is that the mere shock of a cold substance to the surface had something to do with the recovery (this no one will probably deny); but that, superadded to this, there was supplied through the pneumogastric nerves, in this superficial position to the medulla oblongata, the *besoin de respirer* of which in its obtunded state it had taken no cognizance.

Be the explanation what it may, I infer from actual trial that the remedy may be advantageously used in cases of obstinate hysterical paroxysms, and of tardy return to consciousnes from anæsthesia.

By analogy, I infer it may prove of service also in cases of suspended respiration from drowning, hanging, etc., and possibly also from decided over-doses of anæsthetics.—*Dr. J. T. Rothrock, in Phil. Med. Times.*

Report on Nitrous Oxide as an Anæsthetic.—We make the following extract, from the published Transactions of the Odontological Society of Great Britain, of the Second Report of the Joint Committee appointed by the Odontological Society of Great Britain, and the Committee of Management of the Dental Hospital of London, to inquire into the "Value and Advantages of the Protoxide of Nitrogen as an Anæsthetic in Surgical Operations."—Ed. Cosmos.

"From these experiments, so scientifically and carefully conducted, the majority of your Committee are of opinion, with Dr. Frankland and Mr. Coleman, that this agent cannot produce its anæsthetic effect from being decomposed in the lungs or blood, as has been supposed by some; but are inclined to believe that it produces its effect by preventing 'oxygenation of the blood,' an opinion receiving support from the fact that anæsthesia may be produced by the inhalation of such gases as hydrogen, nitrogen, carburetted hydrogen, etc. Holding this opinion, your Committee would still simply recommend, in the event of alarming symptoms supervening during the administration of this gas, that its exhibition should be immediately suspended, and artificial respiration resorted to, as recommended in their former Report, care being taken that the tongue be drawn forward in such cases, if need be, so that no impediment be offered to the free admission of air into the lungs.

"As regards the question whether anæsthesia is produced by the action of the blood in its altered condition directly upon the nervous centres, or in what other way,—a question which has been much mooted, and which has engaged much of the attention of your Committee,—they have to report that they have not yet been able to arrive at any definite conclusion upon it."

Offensive Breath.—For this purpose, almost the only substance that should be admitted at the toilet is the concentrated solution of chloride of soda; from six to ten drops, in a wineglassful of pure spring-water, to be taken immediately after the operations of the morning are completed. In some cases the odor arising from carious teeth is combined with that of the stomach. If the mouth be well rinsed with a teaspoonful of the solution of the chloride in a tumbler of water, the bad odor of the teeth will be removed.—*Boston Jour. of Chem.*

Salivary Calculus.—Mr. Hulke then showed a calculus removed from the neck, the nucleus of which was a small splinter of wood. A woman had had a tumor below the angle of the jaw for six years; it rose with the hyoid bone. Latterly it had become painful and had grown faster. It was not a ranule, and he thought it might be the cyst of a wen which had discharged itself into the mouth, and now become inflamed. He cut down upon it from the neck, and removed a salivary calculus weighing seventy-six grains. In the center there was a black speck, a splinter of wood, the characters of which were distinctly recognizable under the microscope. The woman could not account for the wood being there, but remembered that she had been hit by a snowball in the neck some years ago.

Mr. Nunn mentioned a case where a hay-seed had passed under the tongue, and soon after an abscess formed. It was opened, and a few days after the hay-seed, covered with carbonate of lime, was discharged. A second case was where a serrated piece of grass passed under the tongue, and an abscess formed. It was opened, and a short time after the piece of grass was discharged through the aperture.

Mr. Hulke then related a similar case, where an abscess formed under the angle of the jaw of a countryman; it was opened, and a piece of grass two inches in length was discharged.—*Pathological Society of London; Lancet.*

Chloroform and Morphia; Anæsthetic Action Combined.—The Paris correspondent of the *Med. Times and Gaz.* states that "according to M. Demarquay's own clinical observation, as well as the results of his experiments on animals, the practice of combining the subcutaneous injection of morphia with the administration of chloroform, so far from diminishing, may add to the dangers of chloroform, especially when the patient is already in a depressed condition from hemorrhage, shock, etc. He observes that either of these agents administered separately produces a depression of temperature; and by using the two together he has lowered this by $2\frac{1}{2}°$ C. He is of opinion that the combination should be entirely renounced, and that all our efforts should be directed towards perfecting the administration of chloroform. He thinks that flannel is the best material through which it can be given, and has devised a mask made of it upon which the chloroform is allowed to flow from a bottle drop by drop. The evaporation is continuous, and the patient breathes without any effort, frequently falling quietly asleep without prior agitation. This apparatus, he says, has been employed by a great number of practitioners with excellent effect." —*Medical Cosmos.*

The Effects of Syphilis on the Mouth and Teeth.—Syphilitic affections of the *hard palate* are very insidious, mainly for the reason that the disease commonly begins out of sight, and has made considerable progress before it is suspected to exist. Again, it is very commonly the sole symptom of syphilitic disease, and, in most cases, does not begin until an interval has elapsed of sufficient length to induce the patient to suppose himself thoroughly cured.

The disease begins in the palate as in other bones, namely, in the vascular layer of the periosteum, the first outset being usually at the nasal surface of the hard palate, a little in front of the posterior nares, and near the mesial line Pain is not complained of for some time; but if the patient is observant, he may note that in clearing the back of the throat a little soreness is felt, and when ulceration of the mucous membrane has begun, a streak of blood may mark the mucus or the handkerchief. When this stage is reached, I believe necrosis of the bone, though it may be only to a minute extent, has always taken place. If the history point to syphilis, when the above symptoms are related, careful pressure with the finger, along the middle of the hard palate, will often detect a tender place, even if the patient has not previously discovered it in masticating hard masses of food. In a short time the tender point becomes slightly swollen, the lining membrane being separated from the bone beneath. It also acquires a yellowish tint, and shortly afterwards melts away over the implicated area, leaving a cleanly eroded surface, often not larger than the size of a split-pea, but also sometimes as large as a shilling or more. The bone is usually concealed from view by indolent granulations, but the probe generally strikes bare bone more or less readily, and may even be thrust through the roof of the mouth into the nasal cavity, where the hard parts are already absorbed. If the case be favorable for rhinoscopy, that is, if the soft palate submit to be elevated or drawn aside, so that the mirror may reflect light into the posterior nares, it often happens that considerable ulceration of the mucous membrane is revealed, creeping up the sides of the septum narium, here and there covered by crusts or patches of viscid mucus. Two causes operate to destroy the bone widely: one is the tenuity of the bone, which allows the morbid action to penetrate quickly from one surface to the other, and thus to cut off its connection with the periosteum: the other is the character of syphilitic gummous inflammation, namely, to extend steadily through the medullary elements of the bone, bit by bit, slowly lowering its vitality; and while part is absorbed, another part, no longer nourished, dies. In many cases, when the disease is treated early, the progress is stayed completely, and the ultimate loss of bone is confined to a minute piece, which is replaced by fibrous cicatricial tissue, and no trace but a depressed scar remains. Beyond this, all degrees of deformity, up to destruction of both superior maxillæ and the nasal bones, may result. In by far the larger majority of cases, the disease does not reach the alveolar borders of the jaw, but, commencing at the thin walls of the nasal passages, is arrested before the thicker parts are implicated. In rare instances, however, the necrosis begins as a node on the anterior aspect of the jaw, and produces a limited destruction of the alveolar part. When the disease begins here, the teeth are loosened and fall, leaving the bone implicated with the disease to separate slowly from the unattacked parts. . . . The lower jaw appears to be exempt from syphilitic necrosis, as no cases of such disease are recorded hitherto.

Among the affections of the soft parts within the mouth, *syphilitic inflammation* of the *gums* may be taken first. It is often, no doubt, erroneously attributed to mercury; but it may be observed when no mercury has been given, and, indeed, it differs from mercurial stomatitis in the far smaller amount of salival and buccal secretion that accompanies it. The saliva never drains from the mouth in syphilitic gingivitis; and, indeed, beyond an increase of the mucous secretion, no apparent change takes place in that respect. The disorder is more common in children and women than in men, though it is met with at all ages, and has the same appearance in the infant as in the adult. It shows itself by general swelling of the gums along their whole extent; and in both jaws the parts adhering to the teeth soon ulcerate and expose the necks, but the teeth are not loosened in their sockets in the manner so characteristic of mercurial inflammation. In this state there is scanty viscid secretion, mixed with blood, clinging round the necks of the teeth; mastication is painful, and soreness is complained of; but there is not much, if any, general disturbance,—the tongue is not furred, appetite and digestion remain pretty much as usual. If left to itself, the disease spreads slowly by ulceration, until the lining membrane of the sockets is more or less destroyed, and limited necrosis of the jaw, with loosening of the teeth, is caused. Meantime, congestion spreads along the mucous membrane to the floor of the mouth and the cheeks. Shallow scattered ulcers form underneath and on the sides of the tongue, and white, slightly raised, isolated patches (mucous patches) appear along the inside of the cheeks. Like other syphilitic affections, it is peculiarly obstinate to treatment, until anti-syphilitic specifics are employed, then the inflammation ceases as if by magic, and the parts, unless necrosis has taken place, soon acquire their usual condition. Other syphilitic affections, such as erosions of the soft palate and tonsils, fissures at the corners of the mouth, and probably eruptions on the skin, or on the hairy scalp, are usually present, which lend important aid in diagnosing the cause of the disease. This is not always so. One of the severest cases that has come under my notice, was in the person of a boy of eleven, who had no history of infantile syphilis, or of any other syphilitic disorder, except interstitial inflammation of the corneæ, of which the nebulæ were evident enough. Accompanying his gingivitis were a gummy excavation and sinuous fissures of the dorsum of the tongue; the gummy excavation, by the way, being, in my experience, unique at so early an age. Resisting ordinary local and general treatment for a fortnight—continued partly with the object of establishing the diagnosis of syphilis—the gums improved rapidly with small doses of potash-iodide, being, with the tongue, quite healed in ten days after the iodine treatment had been begun Moreover, an additional confirmation of the accuracy of the diagnosis occurred; the lad, discontinuing his medicine because his mouth seemed well, was compelled, four weeks afterwards, to apply at the hospital again for relief from a relapse of his gum-affection, which was soon set right by iodine without any local treatment.

The *lining membrane of the cheeks and mouth* is so constantly attacked during the period of skin-eruptions, by mucous patches at the points where friction takes place, that a few words of notice may be introduced here. The mucous membrane is generally swollen, somewhat pale and sodden in aspect, while opposite to, and round the neck of the last molar tooth, it is elevated into whitish ridges or patches, the most prominent parts of which are slightly ulcerated and bathed in pus.

These patches are met with all along the cheek opposite the cusps of the teeth, and at the angles of the mouth. In the latter situation the patches assume the form of shallow fissures with projecting edges, and are more or less covered by a dry scab. Inside the lips, owing to constant movement in speaking, and not infrequently to contact with cigars and pipe-stems, the surfaces are considerably excoriated, bleed easily, and are very sensitive. But the production of these patches is especially provoked by a sharp, ragged, or projecting tooth, and a little exercise of the dentist's art will in such cases very greatly facilitate their cure. The concomitants of these frequent affections of the cheeks are similar patches at the sides of the tongue, on the pillars and velum of the fauces, and papular eruptions on the skin.

Besides, by these mucous patches, the lining membrane is sometimes affected by the *erythema faucium* that, best developed on the fauces themselves, may spread over the whole interior of the mouth. It has no practical importance, as it requires no treatment.

In very rare cases, *gummy deposits* form in the substance of the cheek, and break into the cavity of the mouth. They then form deep, tolerably regular pits, of which the edges are somewhat indurated and hardened. In every respect they resemble those produced in the substance of the tongue, palate, and tonsils, which being more frequent will be more particularly described.—*Berkeley Hill, Esq., F.R.C.S., in the Monthly Review of Dental Surgery.*

GANGRENE OF THE MOUTH.—Dr. Smith also exhibited specimens of gangrene of the mouth, with the following histories:

CASE I.—Male, three years old. The eruption of measles appeared June 12th, and in the last of June pertussis commenced. Became emaciated. Offensiveness of the breath was first noticed July 28th, and death occurred August 3d.

Autopsy.—Body wasted. Both sides of pharynx gangrenous; also velum palati; the gangrene involved the gum around the molars on the left side, also the posterior half of left cheek. It extended down the pharynx half an inch below the level of the epiglottis; gangrene also at base of tongue, but epiglottis not involved; larynx and trachea healthy; bronchial tubes slightly injected and containing muco-pus. The lungs are free from inflammation, but the right middle lobe, margin of the right lower, and tongue-like process of the left upper lobe are collapsed. Both lungs readily inflate. The highest temperature during the measles was 102°; during the gangrene, 104°; most frequent pulse during the measles, 140; during the gangrene, 164. There was considerable dyspnœa in the last two or three days from the tumefaction around the larynx. Hence the pulmonary collapse.

CASE II.—Male, one year and two months old. Eruption of measles appeared June 1st; recovered in the usual time, but had diarrhœa constantly afterwards. The gums around the incisors, above and below, began to ulcerate about August 15th, and within a week gangrene commenced. Died August 30th.

Autopsy.—Both cheeks of a purple, grangrenous color from the chin to the eyes. The swelling has considerably subsided since death. On the right cornea is a gray circular ulcer two lines in diameter, and the whole cornea is cloudy. This was observed some days before death; pupil of this eye contracted, of other eye dilated. All the incisors of the upper jaw, and the incisors and one bicuspid of the lower jaw have fallen out, and the corresponding portions of the maxillary bones are denuded of periosteum and jagged. The periosteum is also destroyed to a considerable distance beyond. The cheeks are infiltrated and œdematous. Trachea and bronchial tubes of normal appearance, but containing mucus. Numerous minute transparent tubercles disseminated through both lungs; part of right middle lobe collapsed; posterior superior and posterior inferior portions of left lower lobe in a state of cheesy pneumonitis, with intervening healthy parenchyma; part of the cheesy substance had softened.

These cases present certain points of interest. Measles is regarded as one of the most frequent causes of gangrene of the mouth; but it has seemed to me that gangrene occurring as a sequel of this disease is often more due to complications or sequelæ to which measles is especially liable than to the primary disease itself. In the two cases now presented we see potential causes of the debility which predisposes to gangrene, apart from the measles, namely, protracted diarrhœa, pertussis, and cheesy pneumonitis. The cheesy disease of the lung in the second case, no doubt, dated back to the measles, and according to the doctrine of the production of tubercles now held by pathologists, the minute tubercles in the lungs, which were evidently very recent, originated from detached particles of this softened substance. There were no tubercles in other organs.—*Reports New York Pathological Society, in The Medical Record.*

STRUMOUS HYPERTROPHY OF THE LIP.—This case, a boy ten years old, exhibited a peculiar development of the upper lip, which was thickened and pendulous. This condition had existed for three years; otherwise he enjoyed good health.

This is a curious affection, but it is one that is occasionally met with in young persons with the strumous diathesis. It occurs almost exclusively in the upper lip and in the young of both sexes. In these cases the lip has twice its natural thickness, is hard and rigid, and sometimes shows a tendency to ulcerate. The affection is frequently accompanied by strumous manifestations in other portions of the system, such as enlarged tonsils and psorophthalmia. The firmness and induration of the lip, the absence of coexisting disease in the gums and teeth, and the chronic nature of the enlargement, together with the scrofulous appearance and condition of the patient, will generally make the diagnosis sufficiently clear. No operation is needed for its relief. Attention to the secretions, with some alterative medicine, or a mild course of mercury when other means fail, will generally be all the treatment required.

The patient has a broad nose, and his face has a heavy expression, as if his mental operations were slow. He states that there is no disease in the family of which he is aware, and his parents are healthy people. His tongue is a little coated, but not more so than the American tongue generally is, because everybody eats too much in this country. We find no enlarged glands along the sterno cleido-mastoid or under the angle of the jaw, which so frequently exist in scrofulous subjects. If they were here, however, we should not bring that fact forward as conclusive proof that this, or any disease here, was scrofulous, as they might be enlarged independent of any disease. But from other sources we derive the evidence that this is an enlargement of the lip of strumous origin. We may distinguish two kinds of scrofulous subjects. The first variety are blondes, with blue eyes, and a light florid complexion, with a vigorous circulation and a bright precocious mind. In these the disease manifests itself in the bones, joints, skin, and lymphatic glands, and they are not so liable to suffer from consumption as the second class, who are generally dark, with a pale and unhealthy complexion, tumid lip, and drooping eyelashes; they are dull and languishing, and show no activity of brain or muscle. When I was in Louisville I attended a young lady of nineteen years, who was a blonde with very light hair. Though in other respects healthy, her upper lip was immensely enlarged and indurated to the touch, more so than in the present case. In the case referred to, I derived great benefit from the officinal solution of baryta. This is a powerful detergent and alterative, and is especially adapted to strumous cases where there is a deficiency of blood and the face and lips are pallid; this is not exactly the case here, but it will make a decided improvement in the boy's appearance, in a short time.

℞.—Liquor. barytæ, gtt. iv.;
Tinct. ferri chlorid., gtt. x. M.

S. To be taken in a tablespoonful of water, morning, after dinner, and at bedtime.

We will make no change in his diet; he may take his accustomed food, taking care, however, that he has outdoor exercise, and that his bowels are kept in a soluble condition. We will see him from time to time, and note his progress.—*Clinic of Prof. Gross, Jefferson Medical College; Phil. Med. Times.*

Recurrent Osseous Tumor of Lower Jaw.—This patient had been operated on fifteen years ago, by Sir William Fergusson. At that time he extracted an osseous tumor, involving the right side of the lower jaw, taking away the mental portion with it. There was only a small cicatrix under the chin now to indicate the site of the previous operation. The disease recurred after some years, probably a new growth, and unconnected with the old tumor; and the woman, finding it rapidly growing, was anxious to have it removed again. The back part of the bone was quite sound from the ramus and angle. The question now was, how to remove the disease with the least disfigurement to the patient, who depended for her livelihood, to some extent, on her appearance—as she was a nurse; and Sir William thought it would be much better to make an incision below the jaw, and through it to extract the tumor, than to remove it through the mouth, which would involve a long incision on the face The incision below the jaw would afterwards be little seen, and would not require to be very large, as the soft tissues would stretch a good deal. During the operation, the maxillary artery was avoided by first sawing through the bone and completely detaching the tumor in front, and then very carefully dissecting it back after it was pulled outward to the greatest possible degree. Some portion of the tumor was left after the bulk of it was removed; this was afterwards snipped away. The operator laid it down as an axiom in surgery, that "the best operation is always the simplest;" but the rule has its exceptions in cases such as the present, where appearance had to be studied as much as the removal of the disease.—*King's College Hospital Reports; British Med. Journal.*

INTRA-BUCCAL RESECTION.—Dr. Menzel has recorded two cases which show the possibility of resecting the lower maxillary jaw by means of an incision performed in the mouth. The proceeding which he has employed presents the following advantages: Lesion offering no danger; possibility of resecting the nerve in an elevated situation; absence of cicatrix, of facial paralysis, and of consecutive and salivary fistulæ; facility of performing the operation.—*Archiv f. Klinische Chirurgie.*

DEATH AFTER EXTRACTION OF TEETH.—Dr. Lanyi has recorded, in the *German Quarterly Journal of Odontology*, two cases in which death followed the extraction of teeth. The first was that of a student of medicine, aged twenty-four, in whom the first upper molar on the left side was loosened in an unsuccessful attempt to extract it by forceps. Suppurative periostitis set in, causing necrosis of the alveolar process of the jaw. This was accompanied with rigors, icterus, and pleuro-pneumonia of the right lung; these subsided, but empyæma set in, and death occurred in a fortnight from perforation of the lung. In the second case, that of a strong man aged twenty-six, the root of the right upper molar was left in the jaw; in the attempt at extraction, the alveolus was broken and the gum lacerated. There was some bleeding, which was at first arrested by cotton-wool soaked in solution of tannin, and a plug of cork. The next day, the patient removed the dressing and the hemorrhage returned. Cork plugs and perchloride of iron were applied, but had to be replaced several times in consequence of their being removed by the patient. After some days, it was found that, when the patient was erect, there was a fine stream of blood flowing into the pharynx; it continued in spite of the use of styptics and plugging of the nostrils, and at last the patient died in a state of anæmia. The source of the bleeding from the nasal cavity could not be ascertained at the necropsy. The antrum of Highmore contained fetid brown mucous fluid.—*British Medical Journal.*

TONGUE-SUCKING —Dr. Morris's communication* on "Spontaneous Dislocation of the Jaw through Tongue-sucking," is very interesting, and will become more so if Dr. Morris will kindly put upon record also what is the physical and mental condition of the young lady to whom the accident occurred.

I have taken some pains during the last twelve years to invite the attention of the profession to the blighting effects upon the infant of fruitless sucking, and to show that the retained habits of sucking,—viz., tongue-sucking, thumb-sucking, etc.—and the deformities of the jaws resulting therefrom, are evidences of the individual having been exposed during infancy to this baneful error of management. I think it is likely that facts recorded by some other pen than my own may assist in directing attention to this important subject.—*Dr. T. Ballard, in British Medical Journal.*

TONGUE-SUCKING —In reply to Dr. Ballard, the young lady in question possesses more than an average amount of mental power, and is remarkable for her vivacity. This case confirms, however, the statement made by Dr. Ballard, that deformity of the jaws may result from tongue-sucking, etc., inasmuch as her jaws are narrowed and prolonged, the upper one so much so as to cause the canine teeth to overlay the incisors. This is, however, in a great measure being corrected by a dentist, who has used mechanical appliances, which have expanded the upper jaw during its growth, and brought the teeth into much better position. The young lady is quite well, but insists upon the bandage being applied nightly, as a precaution; and every effort is made to break her of the pernicious habit.—*Dr. Edwin Morris, in British Medical Journal.*

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* Copied in DENTAL COSMOS, January, 1873.

TONGUE-SUCKING.—At the suggestion of Dr. Ballard, I beg to record two cases of abnormal sucking, premising that they were not occasioned by "fruitless sucking," neither were the faculties of the children in the least degree affected. One was sucking the thumb and forefinger, and, after many fruitless expedients, the habit was broken by wearing a splint on the arm, extending below the fingers. The other case was tongue-sucking, and, not being so much under the notice of the parents, it went on for ten or twelve years, causing the decay of the six upper front teeth, which have been replaced by the skill of the dentist. There is little, if any, deformity of the palate. Were I to meet with the like again, I would certainly have the child watched night and day until the habit was broken.—*Dr. Benj. Blower, in British Medical Journal.*

EPITHELIOMATOUS TUMOR OF THE UPPER MAXILLA.—Mr. Lawson exhibited a patient from whom he had removed a large epitheliomatous tumor of the upper maxilla, first by excising the diseased mass, and then by freely applying the actual cautery and chloride of zinc paste spread on small pieces of lint. The man was admitted into the Middlesex Hospital in March, 1872. He had then a soft elastic tumor about the size of a small egg over the superior maxilla of the left side, which was evidently growing from within the antrum. The bone over it had been partially absorbed, and the tumor was pressing upon the skin, which in places was adherent to it. He could blow through the left nostril, showing that the cavity of the nose was not encroached on by the growth. On looking into the mouth, there was a small, soft tumor bulging above the alveolus, about the size of half a walnut. The patient was discharged from the hospital in the following July, all traces of the disease having been eradicated. Mr. Lawson remarked that the cases of soft tumors of the upper maxilla which seem peculiarly fitted to this mode of treatment are those in which the hard palate has not been invaded by the disease.—*Clinical Society of London; Medical Times and Gazette.*

FISTULOUS OPENING ON THE FACE.—Miss X. consulted me early in April of the present year. About six months previously she had suffered great pain in the left cheek, accompanied by considerable swelling. Hot fomentations and poultices were applied, and an abscess formed, which burst externally. The swelling then subsided, but there remained a fistulous opening at the lower edge of the malar bone, which from that time continued to discharge thin, watery pus. On examining the mouth, I found the cheek indurated and adherent along the inner surface of the malar bone and the external alveolar wall of the affected side. The first molar was extensively decayed and broken down, but it had been throughout the seat of little or no pain. There were no sinuses opening into the mouth. The probe passed into the external orifice failed to reach dead bone.

I would remark, in passing, that in my experience it is extremely rare in these cases to find more than one opening when the mischief is due to a tooth alone. When necrosed bone is present, there are almost invariably several sinuses, either externally or internally, discharging fetid pus, and through most of these the probe can be passed easily to the exposed surface of the bone.

In the present case, feeling sure that it was the exciting cause of the suppuration, I at once extracted the decayed tooth.

From this time I lost sight of the patient. In reply to my inquiry, Mr. J. C. Langmore, the surgeon by whom the case was sent to me, kindly furnished the further details of its history and termination. He stated that the duct of the parotid gland had been involved in the inflammation; that it had become obliterated internally, in consequence of the great inflammatory thickening; that upon the occurrence of suppuration it had opened into the abscess; and that the saliva had from that time discharged through the wound. Hence the peculiarly watery nature of the matter. After the extraction of the tooth, he added, the duct rapidly recovered itself, the saliva found its way through the natural channel, and the external opening rapidly healed. On July 16th, the case was quite well, and there was left much less deformity that might have been expected.—*Henry Sewell, M.R.C.S., L.D.S., in Monthly Review of Dental Surgery.*

Case of Fracture of Alveolar Process.—I. H., aged forty-two, a stout, unhealthy-looking Jew, was admitted into this hospital, under the care of Mr. Hutchinson, September 25th, 1872. This patient stated that on September 12th he had a tooth (the second left bicuspid of lower jaw) extracted by his dentist. It bled very freely, and when he reached his home he was covered with blood and exhausted. He sent for his surgeon, who plugged the hole with a solution of iron and lint, and applied ice and alum lotion to his mouth. These means failing, on the following day Mr. Hutchinson was called in to see him. It was then found,—after removing all the clots, etc., and sponging the parts well,—that the inner wall of the alveolar process was completely broken down, and that a laceration of the inferior dental artery was the cause of this very profuse and dangerous arterial hemorrhage Mr. Hutchinson applied a small sponge on each side of the body of the jaw, and compressed these firmly by means of a pair of long clamp forceps. This at once arrested the bleeding. After six or eight hours the forceps were removed, and on the following day the sponges also. After a lapse of several days, however, the bleeding recurred, and the patient was admitted into the hospital. The clamp forceps, applied with sponges as before, at once stopped the hemorrhage. The forceps were removed after ten hours, and the sponges were allowed to ulcerate out. No further trouble ensued, and the patient was, after a few days, discharged, cured —*Lewis Mackenzie, M.R.C.S., L.R.C.P., in Monthly Review of Dental Surgery*

Beads for Retaining Rubber Dam.—These little articles in many cases will be found of great assistance in adjusting and retaining the rubber dam. Those best adapted to this purpose are white in color, and about one-eighth of an inch in diameter. Slip one on a well-waxed thread of E E or floss silk, and tie; then put on another, and tie as before,—so, when adjusted (for instance to a lower molar), the beads will be one on the lingual and the other on the buccal side. Tie this thread firmly, and, if it be necessary, pass the thread around above the beads once more, making them more secure; then slip the dam over the beads, and, if necessary, pass another thread around,—the dam is then very secure.—*G. O. H., in Missouri Dental Journal.*

When to Adjust the Rubber Dam.—It is the practice of the dental profession generally to prepare the cavity for filling before adjusting the dam; but to this practice there is one serious objection, viz., the impossibility of getting the cavity sufficiently dry in the short time allowed after the dam is adjusted before the filling is commenced. It is necessary, in filling a tooth, to produce good results, to have the cavity as dry as possible. Chemistry teaches us that it is almost impossible to make anything *perfectly* dry. It seems reasonable to suppose that a cavity will be dryer if it be prepared, after the dam has been adjusted, than it would if it had been prepared before; besides, it is much easier and quicker to blow (with a dry syringe) the chips and dust from the cavity, than to wash them out and wipe the cavity with some absorbent every time an examination is necessary. Again, there are many cases where, by preparing the cavity dry, much pain is prevented that would have been had it been prepared wet.—*G. O. H., in Missouri Dental Journal*

Cement for Iron.—With one pound of well-dried Venetian red, put three pounds of oxide of iron. Add sufficient boiling oil to make a thick paste.—*American Artisan.*

To Remove Rust from Iron.—Simmer the pieces in kerosene oil for a number of days. This will so soften and loosen the oxide of iron that it can be easily rubbed off.—*American Artisan.*

Soldering Iron and Steel.—Dr. Sieburger publishes the following methods for soldering iron and steel:

For objects of moderate size, hard brass solder is made by fusing together 8 parts of brass and 1 part tin. Soft brass solder is composed of 6 parts brass, 1 part zinc, and 1 part tin.

For soldering small iron or steel articles, a hard silver solder composed of equal parts of fine silver and malleable brass is used, the mass being protected by borax. Soft silver solder differs from this only in the addition of $\frac{1}{16}$ part tin.

Very fine and delicate articles are soldered either with pure gold or a gold solder composed of 1 part gold, 2 parts silver, 3 parts copper.—*Scientific American.*

Foot and Mouth Disease in the Human Subject.—I am desirous of communicating to the members of my profession a short note of the following case, in the hope that some of them may have met with a similar one, and may consequently be able to give their experience as to the best line of treatment to alleviate, and, if possible, shorten this terrible malady.

Miss L., the daughter of a farmer, had always been delicate, but had enjoyed better health than usual last spring and summer. She assisted in the work of a large dairy, the cows of which, during the months of June and July, had been affected with foot-and-mouth disease. She had occasionally fed and milked the sick cows, but was very careful to wash her hands afterwards. She was not aware of any cut or scratch on her hands or arms. She used a considerable quantity of milk as an article of diet; but the family did not drink the milk of the cows while they were suffering from (at all events) the acute stage of the disease. She had not felt well for the last six weeks, and had complained of lassitude, loss of sleep, appetite, and vertigo.

August 20th. On examination, the mucous membrane of the mouth was very sore to the touch; there was considerable inflammation of the tongue and lower lip. The submaxillary and sublingual glands were found hard, nodulated, and painful. The gums were red, and the teeth very sensitive. She said they were loose, but refused to let me examine them. Her pulse was 88; temperature, 99 deg. Fahr. Altogether, the symptoms much resembled those of salivation. A mild saline aperient was ordered, and a mixture containing bark, chlorate of potash, and ammonia. The mouth was ordered to be well rinsed out with lukewarm water.

August 21st (morning). All the symptoms were much worse. The tongue was protruding two and a quarter inches out of the mouth; it was so increased in thickness that the teeth were wedged into it. She could not separate her jaws far apart. A peculiar odour was on the breath. Her lower lip was much increased in thickness; the glands, also, were much harder, larger, and more painful. She could not articulate a word, but wrote on a slate that she was in great pain in the back part of her mouth, evidently at the root of the tongue. The breathing was much impeded, and it was almost impossible for her to swallow any nourishment. A free incision in the tongue seemed at first sight indicated; but, on consideration, I decided to postpone the operation till the evening, fearing excessive hemorrhage in so delicate and anæmic a person; nor did I think much relief would follow, from the state of the tongue itself. The discharge was more profuse; pulse, 104; temperature, 101 deg. Warm poppy-head fomentations, with constant nourishment, beef-tea, milk, cream, etc., were ordered. In the evening the symptoms were much the same as in the morning. The breathing was rather easier. I passed a needle deep into the tongue; no fluid escaped. Pulse, 108; temperature, 101·5 deg. I desired the friends, should suffocation seem imminent, to send for me at once. The treatment was continued.

August 22d. In the morning, she seemed better; the skin was moist; she could take her nourishment a little better; the breathing was easier; the discharge more profuse. She complained still of deep-seated pain in the tongue. Pulse, 98; temperature, 99 deg. In the evening, my friend Mr. Spencer saw the case, and agreed with me in considering it similar to the disease often met with in cattle in this neighborhood. The discharge was now very profuse, running continually from the mouth.

The patient continued in this state till August 27th, when the discharge became thicker and more fetid. She could now take nothing but milk; anything else causing much pain to the ulcerated mucous membrane. The disease pursued the same course, the discharge becoming dreadfully fetid; sloughs also peeling off the tongue. She refused to allow a nourishing enema to be administered. Her mouth was well syringed out with weak solutions of carbolic acid and Condy's fluid; and we thought that in the event of the least hemorrhage she must sink.

On September 17th, hemorrhage occurred from the under portion of the tongue, when she lost about two ounces: it recurred on the 18th and 19th, but was arrested by pressure and tincture of the perchloride of iron. She now began to improve very slowly, the discharge becoming thinner.

On September 25th, the tongue had receded to the outer margin of the lower lip, and she was able to articulate a little.

October 4th She was down-stairs, and able to speak so as to be understood. The tongue had nearly resumed its natural size. The power of deglutition was still very weak, but she could swallow solids in the form of a pill.

The question of incision of the tongue is, I think, an open one; we must be guided by circumstances. I have met with a much milder form of the disease, which occurred in three young children who had drunk the milk from diseased cows; but it readily yielded to a little caustic applied to the ulcers and tonic treatment: but I cannot hear of so severe a case as Miss L.'s occurring in the practice of any of my friends. The character of the disease in the human subject seems to differ from that in the animal, in running a much longer course, and in the feet not being affected. Miss L.'s case also affords an example of the wonderful life-sustaining power of pure milk: she took nothing else from the 25th August to the 29th September, thirty-six days.—*Dr. W. T. Briscoe, in British Medical Journal.*

Syphilitic Infection from Smoking a Cigar.—There are now but few to be found who deny that secondary syphilis may be communicated by such means as kissing, or using a drinking glass; but every case that proves this clearly is useful.

Isaac S., aged seventy-four, came to the Farringdon General Dispensary on July 8th, 1872. The patient had a copper-colored eruption on the forehead, and spots of syphilitic roseola and psoriasis on the right forearm, hands, etc. A portion of the mucous membrane of the right angle of the mouth was denuded of its epithelium, red, and covered with false membrane; the whole greatly like what is seen in so-called "mucous tubercles" of the fauces. A small patch of similar appearance was seen on the mucous membrane of the left upper lip. There were indurated glands below the right jaw. The patient said that, five weeks before being seen, he had first noticed a spot at the right angle of the mouth. This commenced with a kind of blister, and lumps came below the jaw, which still continued hard. A fortnight or three weeks before he noticed the sore at the edge of the mouth, he had picked up a lighted stump of a cigar, just thrown away by a gentleman, and smoked it. A careful examination of the genitalia of the patient, as well as the inguinal region, gave only negative results. The patient's age, seventy-four, the enlargement and induration of the submental glands, and the history of the sore at the side of the mouth, being the first lesion, pointed to the diagnosis made by me,—*i.e.* chancre of the lower lip, caused by smoking a cigar thrown away by a patient in all probability suffering from syphilis.—*Dr. C. R. Drysdale, in British Med. Journal.*

HINTS AND QUERIES.

WHAT is the cause of the elongation of a tooth, although it has an antagonist and there is nothing apparently the matter with it?—P.

A GENTLEMAN, about sixty years of age, came into my office to have some filling done. Upon examination, I found the gums directly over the central incisors presenting a swollen and purplish appearance, and yielding upon pressure a yellowish discharge. The rest of the mouth appeared healthy. The incisors presented no decay, had never ached, but had occasionally been a little sore and a little loose. Is the discharge from ulceration of the roots of those incisors? What is the proper treatment?—C.

I HAVE a patient, a lad about fourteen years of age, whose teeth appear perfectly sound, but when extracted the roots are as soft as cartilage, and their terminations more or less absorbed. What is the cause? and is there any treatment I can adopt which will be of any use?—R. McN.

MY nerve extractors fail to extract a pledget of cotton which I put in the root of a lateral incisor which has abscess. How shall I get out the cotton? or failing to get it out, how shall I treat the abscess?—A. W.

NITRATE of silver will correct abnormal sensitiveness of the exposed necks of teeth. Will it not also obtund the sensitiveness of dentine in a cavity? If so, what is the objection to its use?—T.

REPLY to X.—"The use of sponge or crystal gold." I have used Morgan's plastic gold, both with mallet and hand pressure, and have had no fillings yet spongy, without they got damp while filling; have used A. J. Watts's crystal gold, and like it very much; have used it also by hand pressure and with the mallet, and all my fillings are doing well except those that were not put in well. I have used several different kinds of gold, and come to the conclusion that the trouble is with the operator and not with the gold.—A. W.

REPLY TO "X."—"The use of sponge or crystal gold." Expect only perfect results after a thorough experience in its use. After an experience of fifteen years in the use of it, I consider it second to none in ease of manipulation and durability. Commence by using No. 1, with Butler's or Varney's points, by either hand or mallet pressure, having proper retaining-points; consolidate thoroughly; keep perfectly free from all moisture; commence with small pieces; anneal slightly in an alcohol flame as you use it, if preferred; keep your instrument firm. Take time, until you are well versed in its manipulation, using great care and patience; and when you have had the requisite amount of experience in its use, you will find that if properly manipulated it will make a beautiful, solid, and enduring plug equal to any foil ever used. Finish the same as with any other gold. By and by try No. 2, and then take your choice; No. 2 is a little harder. Failure in its use comes from careless manipulation, too much hurrying, ignorance in the proper use of it, poorly serrated instruments, improper foundation in cavity (or none at all), and a desire to use it with the ease and quickness of amalgam. Give it a fair, honest, and thorough trial; and if you then fail, give a short time of observation of its use in the office of some successful operator.—C. A. P. G.

REPLY TO "X."—"The use of sponge or crystal gold," in December number of DENTAL COSMOS.

I have used crystal gold, alone and in combination with foil, for the last five years with very good success. Am obtaining the best results now with a combination of the two in the following manner: suppose a cavity in a superior second bicuspid, anterior approximal and grinding surfaces involved. Remove the decay and then cut the "floor" of the cavity as nearly as possible at a right angle with the axis of the tooth, or so as to have no "undercut," and consequently no thin, frail edge to crumble under the pressure of packing at the cervical edge of the cavity, which is the spot most liable to failure in this class of fillings. At the outer and inner ends of this floor I drill two substantial retaining-pits, about one-twenty-fifth of an inch in depth, and the same diameter. I then with the small "wire burs" of my "Morrison" cut away the enamel from the grinding surface so that the cavity, looking at the grinding surface, shall be broadest at its posterior portion, or in other words, so that the filling shall be "dovetailed" into the tooth. The perpendicular walls are cut as nearly parallel with each other as the case will admit, taking care to leave no thin, frail edges to crumble. Apply the rubber, dry carefully, and fill the retaining-pits with small bits, not larger than pin-heads, of Watts's crystal, No. 2. Pack thoroughly from the bottom. There's the secret. When the pits are full, and a little more, cover the floor with a piece of No. 4 foil, adhesive, in form of cut rope, welding to the gold in the pits, and allowing the foil to slightly overlap the cervical edge, across which you burnish it with a smooth point. I use the broken points in packing both crystal and foil. Now build up from the carpet of foil on your floor with small pieces of crystal cut off with a sharp knife, about one-sixteenth of an inch thick, and as large as the cavity: directing the pressure from near the center of the cavity towards the walls. Pass each piece through the lamp on its way to the cavity. As you build up, line the sides with foil as you did the floor, allowing it to project slightly beyond the walls, and burnishing it back before covering with crystal. Fill up in this way and cap off with a layer or two of No. 20 or 40 foil, as finishing easier. File down so that the edges of gold do not overlap the enamel. Take time and pack for posterity. Above all things, use your heaviest pressure, or blows, if you use the mallet, at the foundation, and gradually decrease as you fill up, as in this way you avoid the danger of still further condensing the first part of the filling by the force expended in packing the last part, the result of which would be, if the cavity was broader at base than top, to drive out the wedge, so to speak, and make the cavity leak at the sides, which is very common, or, if the cavity be broader at the top, to drive in the wedge,—*i.e.* the filling,—and split the tooth. I believe crystal gold packs *harder*, and will stand the peculiar strain brought to bear upon retaining-points, as in a large contour plug, better than foil, as when it is condensed it has less ductility than a foil plug. At the same time I do not like the idea of lining a cavity with it, as the moisture inherent in the bone of a live tooth will in time cause a peculiar purple discoloration upon the surface of the plug next to it, if it be crystal gold, which is liable to show through the translucent wall and look badly, even when an examination, after removing the filling, reveals no decay or discoloration of the tooth.

My experience has not been as favorable with the crystal in the case of small crown cavities, as in larger and compound fillings, owing to the difficulty of directing the pressure in packing, towards all parts of the walls, while the pellet remained in a soft condition. But a filling like the one described above, if properly packed, *cannot* soften or crumble, any more than a casting of gold could. The great difficulty ordinarily met with in using the crystal gold has been, not to make the plug hard enough and durable enough in itself, but to make it a *tight* plug, touching all parts of the cavity at once, and this because it has a peculiar way of drawing away from the edges when you make a down thrust in the center.

Take a sponge and put it in a tea-cup and press your finger into the center of it, and you will have the idea; and that's the rock upon which many a filling of crystal gold has split, though hard enough to be drawn into wire. I have built up molars three-eighths of an inch with crystal gold, that have stood the strain of mastication, etc., for four years, and from that down to three months, and are perfect to-day. I have failures, of course, but lay them to defects in manipulation and not in material.

There is, however, one defect in crystal gold which forbids its use in cavities upon the labial surfaces of the incisors, particularly in cases where the patient has a strumous diathesis, and that is the unfortunate tendency, never yet explained, to accumulate upon its surface the peculiar purple oxide resembling purple of Cassius. This tendency exhibits itself in a very erratic manner, sometimes one filling in a half-dozen showing it, and the rest clear. It is well in such cases to veneer the crystal with heavy foil thick enough not to finish off, or else to use foil altogether in such cases.—W. E. H., *Danielsonville, Conn.*

Reply to "Junior."—"I had a patient in whom a periodic frontal headache was permanently cured by the extraction of a tooth. What is the explanation ?"

Reference to the fifth nerve exhibits it as trigeminal. Of the three branches, one, the inferior maxillary, supplies the teeth of the inferior jaw and the attribute muscles; a second, the superior maxillary, the teeth and associate parts of the upper jaw; while the third, the ophthalmic division, as it is named, subdivides into a multitude of branchlets, which are distributed respectively to the tentorium, lachrymal gland, caruncula lachrymalis, lachrymal sac, ciliary muscles, and iris, muscles of eyelid and forehead, integument of forehead and nose, mucous membrane of eye and nose, and pericranium of frontal and parietal regions.

Pain is an expression of irritation, being the result commonly of pathological conditions. Nerves—which are the seat of pain—possess the capability of reflecting pain; that is, a worried dental or any other branchlet of a nerve may reflect the expression of its disease to any other branchlet that may be in direct or indirect relation with it. Thus, in the instance cited, the headache is readily appreciated to be but a reflected odontalgia. The extraction of the diseased tooth removed the cause; it was natural that the effect should follow. Many curious and most instructive and suggestive cases of reflected toothache are to be found recorded in a class of books with which it is very evident our querist is hardly as familiar as he should be.—W. T. E.

Reply to X. Y.—"What is the *rationale* of what is called dental fever,—*i.e.* fever resulting from the irritation of erupting teeth? And what is the best treatment?"

Dental fever signifies irritation. A source of irritation too long continued, or of unduly severe character, results in a perversion of the circulatory system. Called to a case of dental fever, the practitioner is to be directed to his conclusions and practice by the local presentments of his patient. A dental fever may reside exclusively in that general irritability of the nervous system at large, which, in the nervous, irritable temperament, is so easily aroused and tends to a species of self-prolongation,—the irritation being confined to the nerve substance, and in no perceivable way affecting the vascular. There is heat; but it is somewhat the analogue of the electric discharge: a moment, and it suffuses the little patient; a moment, and it is gone. It is that heat so frequently felt in the slip that springs the ankle, or which shocks by an unexpectedly long step. True dental fever, however, signifies vascular perversion: the heart beats unduly, the pulse is found irritable and excited, and a heat of surface is persistent. Examining here the mouth, it will be the exception when tenderness, tumefaction and a glistening redness are not found somewhere about the gum, the signification pointing to erupting teeth,—on the principle that inflammation is the expression of irritation, and a source of irritation being here very perceptible. An indication which, more than likely, is found to include all others, directs the simple lancing of the confining part; this relieving the pressure and restriction, all symptoms are, as a rule, found quickly to subside.

In the plethoric irritable temperament, however, circulatory disturbances aroused, medication will not unlikely be compelled, that the disturbances be quieted. Here, as a medicine, few better combinations may be employed than is to be found in the union of the bromide of potassium and the tincture of veratrum viride:

℞.—Potassii Bromidi, gr. xx;
Tincturæ Veratri Viridis, gtt. iij;
Aquæ, ℥ij. M.

Dose.—Tablespoonful, repeated after two hours, if necessary.

Lemonade, made strong and sweet, is an admirable febrifuge, and is commonly most greedily taken by children.

When head-symptoms are prominent, it is always desirable to counteract the manifested local congestion through the agency of a hot foot-bath, while not unfrequently a marked indication in conjunction consists in the employment of cold, in the manner of vinegar, cologne, or alcohol wet cloths, to the affected part.

Lancing a gum is a simple operation, consisting in making a plain incision over the incisor teeth, and a cut of crucial character over the cusp teeth. Such incisions are to be carried to that depth which opens the envelop and exposes to the blade the touch of the enamel. To lance a gum it is found convenient to have the body of the infant resting upon the lap of the nurse, the legs and arms being thus under control of the assistant, while the head is recumbent upon the knees of the operator.

In a resisting dental fever, it is not to be overlooked by the practitioner that conjoined offences may exist: irritation may be kept up by parasite-loaded bowels, by the presence of miasma in the system, by mesentery tubercles, by a syphilitic or scrofulous association. Treatment to be full and scientific must be directed by an education capable of appreciating collateral as well as immediate conditions.—A. W. C.

Reply to "T. P."—"What is esteemed to be the best method of opening an anchylosed jaw?"

An answer to this question refers primarily to the character of the anchylosis. Fixedness of the lower jaw implies great variety in causation. As met with, however, in ordinary dental practice, the fixedness is commonly of that variety described as false anchylosis, being a condition in which, from inflammatory disturbances, the parts, muscular and other, are stiffened through effusions and infiltrations of lymph. This form of the condition is found commonly associated with abnormal relations of the dentes sapientiæ, depending indeed, as most often encountered, with the jamming of these teeth under the rami, and their retention in this position by the overlying molars,—the unsuccessful effort at egress provoking the inflammation which is the origin of the anchylosis. Cure, in these cases, is mostly found in an extraction of the second molars; or when such result does not attend the operation, there is necessitated the local employment of rubefacients and the use of the wedge. Of instruments designed for the breaking of the fixedness, preference would seem justly to be given to Kolbe's screw; with this lever any amount of power may be obtained.

In cases of dental inflammation, where ostitis and neurosis have ensued, it is commonly found that the restoration of action depends on the coming away of the sequestrum; passive motion is, however, a necessity during the interim,—otherwise, true or bony anchylosis may result.

Trismus, of constitutional or tetanoid signification, finds its diagnosis in the spasmodic nature of the closure and in its association with quickly following relations; thus spasms of other muscles ensue,—opisthotonos, emprosthotonos, or pleurosthotonos,—demonstrating the systemic expression of the disease.

Anchylosis, inter-articular, signifies inflammatory disturbance, and not unlikely disorganization of the joint itself; the degree and extent of involvement varying with almost every case. The symptoms here expressed are excessive pain of the part involved, in movement, tenderness on pressure, together with external exhibition of the inflammatory phenomena. Treatment consists in rest, and in the pursuance of a most vigorous antiphlogistic course. Leeches are to be employed locally; hot foot-baths are to be freely used; diaphoretics, saline cathartics, and, if the patient is robust and vigorous, blood may be demanded to be taken from the arm. If, in defiance of treatment, inflammation should proceed to suppuration and to the disorganization of the joint, anchylosis may be the best result hoped for,—a false joint being made at the angle or somewhere on the line of the ramus. Should, however, a sequestrum present, advantage is to be taken of the break in the continuity, and by passive movement, persistently continued, or in active motion, if the patient may be persuaded to endure the pain of the free opening of the mouth, the artificial joint may be here secured.

Rheumatoid arthritis is noted as a cause of fixation frequently to be met with; here the diagnosis, as in tetanus, is found in the associations. Rheumatism, attacking the maxillary articulation, demands the same general treatment as when found elsewhere situated. Garretson commends, as a combination having a specific character, the following:

℞.—Potassii Iodidi, ℥ss;
Extract. Belladonnæ, gr. vi;
Vini Colchici Radicis, ℥ss;
Tincturæ Guiaici Ammoniacæ, ℥vi;
Aquæ Cinnamonii, ℥vi. M.

Dose.—A tablespoonful to be taken in wineglass of water three times a day.—E. S. M.

Case in Practice.—In August, 1871, Mr. S., railroad conductor, applied to me for relief from the toothache. On examination, I found that his mouth was in a very bad condition,—so many cavities that I despaired almost of finding the aching tooth; but finally it was discovered to be the right inferior first molar; pulp exposed but very recently; decided that it was a case for capping; applied creasote, which soon relieved the pain, and directed him to call in two days, which he did, and I capped the pulp with os-artificiel. When it was hardened sufficiently, I filled with amalgam. On that and a succeeding sitting, I filled five other cavities. I did not see him again for a month, when he presented himself with half a dozen or more teeth aching, which were treated and filled as I did the first one. The total number of *exposed pulps that were capped with os-artificiel in this mouth was thirteen;* the number of fillings inserted thirty-six.

What I wish to call especial attention to, is the fact that persons whose business and inclination permit of much bodily exercise during the day, either walking considerably or being out-of-doors constantly, are better subjects for successfully capping exposed pulps. In the above case, the pulp of every tooth is alive after a lapse of fourteen months. I attribute the fact of their being so, in part, to the constant moving of the patient. I have further data to refer to in support of my theory (if any one else has advanced such a theory I am in ignorance of the fact).

In the course of my practice for the past five years I have had occasion to treat and fill teeth with exposed pulps for quite a large number of farmers, letter-carriers, policemen, and railroad men, all of whom have plenty of exercise physically.

Comparing the result of such cases treated, with an equal number of persons whose business does not permit of much bodily exercise, I find that out of one hundred cases of the former *two* per cent. have been lost, whilst of the *latter five* per cent. were lost. This may not appear to some of much importance, but I believe it is, and my object in writing this paper is to call the attention of dentists, and country dentists in particular, to the importance of preserving the tooth pulp alive. Find out what your patients' habits and business are, then treat in the light of this suggestion, and you will be more successful. It is certainly no more trouble to treat a tooth pulp for capping than it is to destroy and treat for filling,—this is my experience.

It is not necessary at this late day to enter into the details of the treatment which an exposed pulp should have for capping, for so many have already written on this subject that it must be thoroughly understood. I should like to hear the expression of others who have the facilities for observation.—A. W. HARLAN, *Chicago, Ill.*

METHOD OF PIVOTING TEETH.—During eight years I have employed the following method of pivoting teeth, with the best results in every case. Many of them I have seen lately that have been in the mouth from three to six years, and they are all as firm as at first.

First treat the root to be pivoted according to the condition. After it is completely cured, prepare the root by making the canal as large as possible by drilling; next, take an acute impression of all the front part and the teeth; make a model; take another impression, and make a second model; cut away all the teeth, leaving only the root to be pivoted and surrounding gums. Make a die and counter-die from the second model; stamp a medium thickness platina plate; perforate where the pivot will be; stamp again; make a pivot of platina wire, using a long piece, so that it can be handled easily; place the plate on the plaster model, and secure it in place by a little wax; cut away a little of the plaster from the model, where the tooth will rest on the gum, so that the tooth will force a little on the gum. Back a plate tooth with platina, and grind to fit the model; put the plate over the root, and pass the pivot through the hole of the plate; when in proper place, fasten it with shellac, and remove with care from the mouth; place it in half plaster and half-pulverized pumice-stone; run a little gold solder, enough to hold the pivot and plate together; put in acid, and then bend the wire backward (not the pivot); warm the plate and put a little shellac on it, also a little on the backing of the tooth; then put the pivot and tooth in proper place in the mouth; heat an instrument quite warm, and apply it to the back of the tooth and plate until the shellac fastens both properly; remove with much care from the mouth, place in plaster and pumice, and solder, putting on plenty of solder to make out of gold as near as possible the shape of the best part of the tooth. When cold put in acid, wash and shape with files, etc., as near as possible to the natural one. Cut the pivot all over with a sharp knife like the barbs of a nerve broach; then prepare the root at the top or end by making a dovetail as high up as possible; fill this with gold, and finish; then prepare the remainder by dovetailing in several places of the root for the reception of the pivot, which must be very loose in the canal; dry the cavity; prepare some bone filling as thin as possible,—not too thin; pack rapidly into the cavity; then place some bone filling around the pivot, and push up with a little force, till it comes to its proper place; keep it there until hard, then coat the tooth and gums over with varnish; let it dry, and varnish again, and the tooth is ready, and will be as firm and as good as the natural ones. The bone filling, being hermetically inclosed, will not be easily affected by the saliva and other fluids of the mouth. The pivot being of platina, it is not so easy to break. The pins of the tooth when riveted are not filed even with the plate, as the solder holds more firmly on them.—MANUEL TRUJILLO, D.D.S., *New York.*

THE AGE OF IMPROVEMENT.—"Improvement—Valuable addition."—*Webster.* Within the last few years we have made a great many improvements in dentistry, some of them valuable additions, and some of them additions without value; it is of the latter class that I purpose to write.

It was once remarked within my hearing, by a prominent member of our profession, "that we should not read the old works on dentistry, for the operators of the present day were obliged to *unlearn* what they knew, in order to keep up with the times." Now this may do very well for some people; but if more of us *would* read the old publications, it might prevent some from rushing into print to display their so-called improvements.

Look into almost any of the dental journals of the day, and you will find a notice of somebody's patent for this or that; somebody's *improvement* for this; new way of doing something; and a thousand and one things, good, bad, and indifferent, that were originally published years before.

The latest patent, I believe, is Mack's screws, for retaining fillings and pivot teeth,—and in the advertisement recommending them as an "advance in the right direction," and "just the thing," are the names of men claiming to be teachers in the profession; and yet they are guilty of ignoring the fact that the same thing was published by Dr. Dwinelle, of New York, in 1855.

Delabarre, of Paris, published the idea of retaining a pivot tooth by means of a screw in the center of the root in 1820,—and in the majority of the roots we are called upon to pivot a single screw in the center is more *practical* than two would be. Are these teachers advancing so rapidly that they are obliged to forget what they knew yesterday to make room for what they expect to know to-morrow?

Next let me call attention to heavy foil, which has been introduced as something new within the last few years. The first gold fillings ever inserted by an American dentist were done with heavy foil,—about No. 30,—and the improvement from that time was thinner foil; we kept on improving until we reached No. 2, which was "just the thing;"—now we are *improving* again until we arrive at No. 240. Is it a valuable addition to return from whence we started?

Again: a short time ago (comparatively) the mallet was introduced as an improvement; first made of wood, then ivory, then tin, then lead, and last iron or steel (and smooth-pointed pluggers), and there we are where we began. If you don't believe it, refer to Fitch,—published in Philadelphia in 1835,—where you will find that it was the custom of some dentists of those days to use a hammer and punch (as he calls it) in filling teeth.

I do not want to be understood as objecting to the use of the mallet, heavy foil, or "Mack's screws," for I have used them all; but I do object to their being called *new* improvements, for they are not. I believe in giving to every man the credit due to him, instead of claiming all the credit to ourselves.—FRANK A. HUNTER, *Cincinnati, O.*

DEATH FROM ADMINISTRATION OF CHLOROFORM.—On the 30th day of November last, Dr. Westbrook, of Dyer County, informed me that he had assisted at an operation during which the patient had died from the effects of chloroform and ether, given in the usual proportion. Dr. Westbrook is an experienced surgeon, having served in that capacity during the war, and I accept his statements without question. The patient was a boy ten years old, robust and stout for his age. His lungs and heart were normal in their functions, as far as could be discovered. His mind was good, being an intelligent boy. The operation was to straighten the knee-joint. They were about half through the operation, when the patient rose from his reclining posture, vomited freely, then lay down, and in less than ten minutes, notwithstanding all their efforts, he was dead. No post mortem was held.

Dr. W. had administered chloroform to a lady two days previous, for whom I was extracting teeth.—T. C. EDWARDS, D.D.S., *Brownsville, Tenn.*

THERE is need, and we think there would be a large sale, for a good work on dental æsthetical prosthetics; also for a systematic treatise on hygiene of the teeth, for popular instruction; and we have no doubt that the Life of Dr. Chapin A. Harris, the father of American dentistry, would find a host of readers.—A. H. T.

TREATING SENSITIVE CAVITIES.—Twice have I had occasion to resort with the happiest success to the practice advocated by Dr. A. H. Brockway (DENTAL COSMOS, January, 1872, page 17), regarding sensitive cavities, and the possibility of such being excavated with very little or no pain, "if they be kept perfectly dry" during the process.

Case I.—Miss J. presented for the purpose of having her right upper central incisor filled on its distal surface. On commencing to excavate the carious cavity, I found that it was so exquisitely sensitive that on the gentlest touch of the excavator she would complain of such a torturing pain as to make it utterly impossible for me to proceed. I resolved upon making an application of chloride of zinc, the agent which, in my hands (excluding the exceeding pain its application occasions), has proved the most successful; but remembering Dr. Brockway's suggestion, resorted to his method, and succeeded to my entire satisfaction.

Case II.—Mrs. L. called to have her right upper canine filled. On commencing its excavation, I found the carious cavity exceedingly sensitive, so that notwithstanding her most earnest desire to preserve her tooth, she demanded that I should either extract it or allow her to leave the chair, as the pain caused even by the slightest touch of the excavator was unendurable. As in the former case, I applied the rubber dam, and after thoroughly drying out the cavity, excavated it with almost total immunity from pain on the part of the patient, and to my own and her great satisfaction.—SERGIO M. ROSELLON, D.D.S., *Colombia, S. A.*

THE

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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

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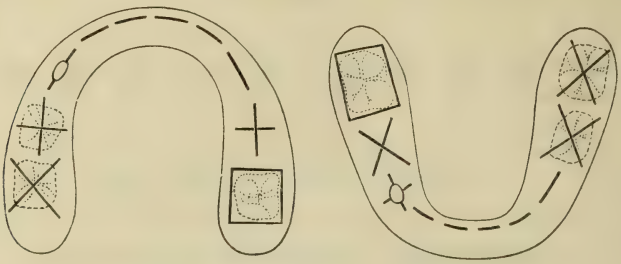
(Continued from page 62.)

I HAVE already spoken of the operation of "lancing the gums" as being "properly done, efficaciously resorted to, skillfully and thoroughly executed," etc., and I wish now to impress the knowledge that most of the obloquy which has been placed upon this valuable means for alleviating suffering and saving life is due to the imperfect and unskillful manner in which it has almost universally been performed. It has, until comparatively recently, been thought sufficient to make a single straight incision in the swollen gum over the coming tooth, and in too many instances even this much has not been done, and with but a scratching of the mucous membrane with the point of the lancet, children have been left to die, and gum lancing has thus been *proven* to be of no avail. Some years since "crucial incisions" began to be advocated, and these were marked upon the gums and even cut into them without any regard to the anatomical adaptation of this most excellent idea, and thus *even these* were shown to be no better than the old method. Such facts are enough to show the need for a very different degree of education in this connection; and, as I shall point out the manner of lancing each tooth, and the reasons for so doing, it will be the more readily seen that but little ought to have been expected from such lancing as has been employed, and that were it not of marked utility, even when done imperfectly, it could not have so impressed specialists as to have induced them to urge its adoption, and labor to perfect its application.

In lancing for the centrals and laterals, of both upper and lower jaws, the incisions should be made nearly over the cutting edges of these teeth; but while the cuts in the upper jaw should be made rather exteriorly to the center of the alveolar ridge, those of the lower jaw should be inside of the center. The single cut over the cutting edge removes, practically, all impediment to complete eruption; for, as the teeth become thicker in one direction, they become narrower in the other; the object in lancing a little externally above and a little internally below is to offer pathways to the teeth, which shall tend to favor the production of the normal occlusion by guiding the upper teeth outwardly and the lower ones inwardly.


UPPER JAW. LOWER JAW.

The first molars (twelve months teeth) should always be lanced with crucial incisions at least; but it will be observed, by studying the anatomy of these teeth, that a more decided difference exists between those of the upper jaw and those of the lower than between any of the other teeth thus compared. It is for this reason that we lance the "year old teeth" of the upper jaw with a crucial incision, as delineated in the diagram of the upper jaw, thus relieving tension over the most prominent points of these teeth, the buccal and palatal cusps; while we lance the corresponding teeth of the lower jaw with the crucial incision thus, X, because in this way we reach the most prominent points of these teeth, —the two mesial and two distal cusps. In the routine of normal eruption I have given the cuspids as following the first molars, and we shall find an unusual degree of importance attached to them both pathologically and surgically. The "second summer" of infancy has, from sad experience, become very generally regarded as possessed of peculiar trials. This is the knowledge of the many, but it is the knowledge of the few only which recognizes that upon pathological dentition alone depends most, if not all, of the danger. All children born during the cold months naturally erupt their centrals and laterals, comparatively easy teeth, during the warm months following, having, as a rule, *even yet* the solace of the mother's milk to comfort them. These erupt their first molars under the bracing influences of the following cool months, but when the long-continued cold has begun to depress rather than strengthen, when those influences are at work which we as adults recognize as productive of that lassitude which we call "spring fever," then the cuspids (lower), difficult teeth to erupt, commence their irritation, precluding the possibility of invigoration from the genial months of May and June, and followed by the cuspids (upper), also difficult to erupt, when the little one is least able to bear any increase of suffering. Now the hot months come, and with the long and burning days and weary restlessness of stifling nights, the cusps of tooth after tooth peep through the gums. It is somewhat strange, but in this method of eruption consists a larger portion of the danger from these teeth. If lancing has been resorted to, even more than once, during all this long period of trouble, it is almost universally abandoned as an utterly useless thing after the tooth or teeth are through. *This is by no means the case;* it is but the small point of the cusp which has made its appearance, and in so doing it has lost, almost entirely, its mechanical ability to erupt, for the smooth, increasing cone now pushes against an inclosing ring of gum, rendering it white in its tenseness, and irritating as much if not more than ever before. All this comes with increase of temperature, increase of systemic derangement, and decrease of strength to resist. Is it any wonder that the cuspids make the second summer to be dreaded? They should be lanced with a straight incision, long before tumefaction of the gums presents, if the symptoms demand it. They should be lanced when tumefaction of the gums exists, because the signs indicate it. They should be lanced after eruption, as figured in the diagrams, by two or four clips, to continue the relief of suffering, and thus the second summer of these children may be robbed of almost all its terror.

All children born during the warm months naturally erupt their centrals and laterals during the following cool months, and pass the most of their first summer during the interval which elapses between the cutting of the last of the laterals and that of the year old teeth. They have the strength for this, which has been gained by the out-of-door exercise; they have been able to enjoy the recuperative influences of that country or sea-side sojourn which, sick, they could not have had. They cut their cuspids during the cool months, and the second spring finds them with their second molars (two years old teeth) preparing to erupt. During the second summer of these children, the four second molars—large teeth, difficult to cut—make the same draft upon their vitality that we have seen the cuspids make upon the others. My experience teaches me that these teeth are equally dangerous with the cuspids, and that they are even more promptly so. While the cuspids literally wear out the children from long-continued exhaustive suffering, the second molars crush and destroy by magnitude of irritation. Thus it is that in these cases the X incisions should be employed, alike above and below, for it will be seen that in this way the most prominent cusps of both superior and inferior teeth are cut down upon, and thus distention effectually removed. But there are cases in which even this is not sufficient dental interference: where the children have passed rapidly through all the complications of dangerous dentition; where the outcries of pain have given place to moaning; where the paroxysms of suffering have gradually *seemed* to grow less; where the child has ceased to complain when laid down, because the brain is obtunded by congestion; where the high flush has changed to purple, and where the stertorous breathing denotes that unless relief is speedily given the end is at hand; *then*, without resistance from the infant, without the infliction of a pang of pain, we take the whole block of gum (see diagrams) from off the coming teeth, showing the whole articulating surface through the square opening, watch for and guard against hemorrhage, and await the result.

Some of my happiest experiences in practice have been in just such cases, when everything seemed darkest, when every hope seemed gone; for such prompt relief has been afforded by this operation that a few short hours have sufficed to bring the brightness of happiness into those households, and to make all interested thorough converts to the practice of "lancing the gums."

Dangers of lancing.—These are, first, accidental wounding of adjoining parts, as tongue, lips, cheeks, etc., which occurrence in the slightest degree would be annoying, and which might easily amount to a severe wound. It is therefore urged that the utmost firmness, care, and skill be exercised for the prevention of danger in this direction, and that the assistant be cautioned as to the necessity of giving that kind of aid to the operator which shall tend to secure a desirable consummation; but with all this latter the operator should invariably act as though *everything* depended upon himself; thus, he should have his instrument properly guarded by bandaging as directed; he should have all surrounding parts thoroughly protected by finger guarding; he should hold *firmly*, though gently, the jaws of the infant; and lastly, he should be ever upon the alert for any untoward movement of the little patient.

2d. *Injury to the coming teeth by undue force in lancing.*—It should be borne in mind that all infantile tissues, even osseous and dental, are comparatively delicate in structure, and that unnecessary violence may easily be done mechanically, while the formative processes may be interfered with by equally unnecessary laceration of parts; the aim should therefore be to lance carefully and gently, while lancing efficiently.

3d. *Danger from excessive hemorrhage.*—This, while comparatively speaking an infrequent danger, becomes sometimes a very serious and indeed fatal complication; it should therefore be always recognized and thoroughly understood. Hemorrhage such as ordinarily results from the operation of lancing is the very thing which is desirable, as it naturally affords relief to the tissues which are surcharged with blood, and though the infant is stimulated by the taste of the blood to suck the gums, it is nevertheless an unusual thing that these are sucked injuriously. At the same time it must be remembered that infants do not spit out, as we understand "spitting," but only thrust out with the tongue objectionable material, or throw out of the mouth, as in emesis; the same taste of the blood which provokes sucking induces swallowing, and thus ordinarily a sufficient amount of blood is taken into the stomach to induce a slight feeling of nausea. This is not unfrequently rather beneficial than otherwise, as it tends to produce that lassitude which is regarded as antiphlogistic, while, if occasionally a greater quantity of blood than this is swallowed, a degree of nausea is produced which provokes emesis, and the irritant is thrown off in clotted form, thus being its own corrective. It is therefore proper always to examine as to the amount of hemorrhage, to absorb for a time the flowing blood by napkins, and, tolerably promptly, upon the indication of a cessation of bleeding, to have the child given the breast or the bottle, that it may expend its suction powers upon the nipple, rather than upon its own gums, that it may take into the stomach that which shall nourish rather than enervate, and that the sequence shall be a refreshing slumber, during which shall come rest from irritation and exemption from further danger from hemorrhage by a certain degree of coagulation. But, as has been stated, it sometimes is the case that complications from hemorrhage become serious and even fatal, and, from some of the very facts which have already been mentioned in connection with innocent and even beneficial bleeding, the knowledge of the extent of prejudicial hemorrhage is not obtained until much valuable time has been lost and great weakness has supervened.

It is seldom that dangerous hemorrhage is promptly excessive in quantity, for, when bleeding from lancing is profuse, it is usually carefully watched and at the desired time successfully arrested by the use, locally or constitutionally, of some of the numerous hæmostatics, and measures are taken to prevent its recurrence if they are deemed necessary. But it is with adynamic patients, and especially such as are more or less markedly of hemorrhagic diathesis, that the scanty but persistent oozing of blood from the cuts occurs; this takes place in such limited degree as to completely escape observation; it is swallowed by the patient, and proves only sufficient to induce that degree of nausea which results in listlessness, pallor, loss of appetite, and weak fretfulness, and during all this time the gradual loss of blood is rendering the system less and less able to meet any demands upon it. These are cases which always call for the exercise of the utmost attention and skill, and which sometimes baffle every effort for their control. It is in these cases quite equally with any others that the specialty of dentistry shows itself the offspring of general medicine, and it is equally true that here it is able also to prove the increased reliance which can be awarded to the specialist. The trouble is *dental* with a constitutional complication; the treatment is *dental* from a constitutional stand-point. The position of the child, almost upright, or at most semi-recumbent, is directed in order to utilize, for the benefit of the jaws, the controlling power of gravitation upon the circulation; the feet and limbs are bathed with gently-stimulating lotions, such as warm alcohol and water, equal parts, or tincture of capsicum, one part to warm water three or four parts, and are *kept warm* by heated wrappings, or the ordinary bottle of hot water, in order that the blood may be derived from the head. The local applications to the wounded gums are made in a dental manner, which is thorough and accurate, in contradistinction to the general applications over the gums by means of the end of the finger; and for this purpose I recommend, after carefully wiping off the surface of the wounded gum with alcohol by means of thumb forceps (foil carriers), armed with a pledget of cotton, the neat application of the dental tincture of iodine (iodine ʒiv, alcohol ℥i), made from a nicely-pointed piece of orange-wood. I have found a solution of tannic acid in carbolic acid (creasote) to meet the indications very well, when applied by means of a small camel's-hair pencil, and have also, for some years, relied much upon tincture of erigeron Canadensis, *applying it freely to the gums;* but for the past few years I have used *in the same way*, almost exclusively, the tincture of chenopodium album (not officinal), and have, as yet, found nothing which is so universally to be depended upon. The utility of constitutional treatment must of course be admitted without argument, but it will readily be seen that, as a rule, this must come within the province of the general practitioner; it is therefore unnecessary for me to more than mention the advisability of promptly employing some preparation of iron, compounded as an elixir, that it may be decidedly palatable, together with the administration of either tincture of erigeron, or tincture of chenopodium (this latter not to be confounded with the chenopodium anthelminticum of the Pharmacopœia), as tonics and hæmostatics. These tinctures I give in *one drop* doses, in water, for a few minutes (five to fifteen), followed by a drop every half-hour, hour, or few hours thereafter, according to indications. It should be known that in these cases great benefit is derived from the *frequent* administration of comparatively small amounts of nourishment, rather than less frequent indulgence in larger quantities, and this method of feeding should be advised, at least during the continuance of danger.

Whenever in practice I have had a little patient who experienced trouble from hemorrhage after the lancing of the gums, I have always indulged in constitutional prophylactic treatment whenever upon subsequent occasions the operation seemed again demanded, and thus by the immediate administration of two or three drops of either of the above-mentioned tinctures, twice or three times daily, I have happily avoided all subsequent complication.

LARGE CROWN-CAVITIES WITH WALLS UNBROKEN.

BY M. S. DEAN, CHICAGO, ILL.

In the periscopic department of the DENTAL COSMOS for December, 1872, appears (copied from the *American Journal of Dental Science*) a very forcible yet gentlemanly criticism, written by Dr. E. L. Hunter, on a portion of an essay which I read before the Illinois State Dental Society in May last.

Judging from the quotation which was made the subject of this review, the writer must have seen only the synopsis of that essay, which was published in the August number of the DENTAL COSMOS. For this reason he is not responsible for misinterpreting what little was offered in support of the proposition laid down in the essay.

In the synopsis, distinct subjects were included in *one* paragraph.

As what was written upon this subject in the essay was brief, and will answer the main objections raised in the review, I will insert it here *seriatim*, as published in the transactions of the society. That portion printed in italics was published in the DENTAL COSMOS in one paragraph, and is made the subject of criticism:

"*In filling a large crown-cavity, with surrounding walls unbroken, it is not sound philosophy to keep the central portion of the filling lower than the peripheral, especially when the work approaches completion. If, during the process of filling, the plug maintains a concave surface, the force applied has a tendency to draw the gold away from the surrounding walls.*

"It is difficult, if not impossible, in such cases, to beat the metal down against the margins so as to adapt it perfectly in all its parts; for, as before stated, the gold being somewhat elastic, cannot be brought into absolute contact throughout the entire periphery of the filling. *These can be made perfect only by the principle of wedging.* If, after the center of a large filling is nearly or quite complete, there be a shallow groove left around the margin of a cavity, we can, with a properly adapted instrument, *wedge* the foil into the groove in such a manner as to make the union absolutely perfect. If in this groove light, unannealed foil be used in contact with the margins of the cavity, and perfectly secured by overlapping cohesive (gold), I think it would accord with sound philosophy.

"*Gold should not be forced* UNWILLINGLY—*so to speak—into any* *portion of a cavity where cohesion is important, or against the walls of a cavity.* The pellet, or piece of gold, should show its affinity, or affection,—as Atkinson might say,—for the filling upon which it has been placed; for if they do not cohere or hold together until it has received two or three blows, we cannot rely upon permanent cohesion. It *may* scale off afterward, though malleted down ever so smoothly. *The pellet and plug must unite by the 'first intention.'* "

It will be seen that the first and last sentences in the last paragraph were taken from a succeeding subject, and had no reference to the "large filling in the crown cavity particularly, but to any portion of a filling where cohesion is *important.*"

Even as the quotation stood, I cannot understand how my reviewer became so strongly impressed with the idea that, according to the theory expressed therein, every piece of gold used in "a large crown-cavity" must be united to its fellow by the "first intention"; for, according to his quotation, I did not say that such union was *always* "important"; and, from the very fact that I did say (as quoted) that the gold should be thus united "*where* cohesion was important," was inferentially equivalent to saying—there are places where it is *not* important. I should have attempted no defense here had not the weight of the writer's argument rested mainly on this point,—the union of the pellet and plug by the first intention.

Although I respect my critic both for his candor and ability, I fail to see the fallacy of my proposition, even as he understands the statement of it. He says:

"Now, I ask, how will the doctor get wedge pressure with adhesive or cohesive pellets along the margins of said fillings, and at the same time get a union by first intention? The very principle of a wedge is otherwise."

Now, if I understand him correctly, he assumes that a pellet of cohesive foil cannot be introduced into the nearly V-shaped space, between the margin of the tooth and the filling, so that one portion shall adhere to the filling by the first intention, and another part of the same pellet press against the walls. If there be lateral pressure against the walls, there must be a corresponding pressure against the filling with which it coheres. This would assuredly constitute a wedge. But I am going beyond my purpose, and my first proposition. In my essay I expressed my preference for *light, unannealed foil* for this part of the filling; and yet I should not condemn the use of cohesive foil.

The method of filling similar cavities ("large crown," etc.) as described by Dr. Hunter, and which I believe is the favorite one of many good practitioners, to me seems somewhat objectionable. He says:

(*a*) "Our method of filling these cavities is to *keep* a slight con-"cavity to the plug until the margins are completed, by means of "which we are enabled at all times to observe what adaptation we are "making to the walls; we exert our force nearly always in the direc-"tion of the bottom of the cavity, or at least nearly parallel to the "wall against, or touching, which is the pellet we are condensing.

(*b*) "Force upon the center of a very poorly condensed filling does "'have a tendency to draw it from the walls,' but if the plug is con-"densed all the way, each pellet from the bottom, any additional press-"ure *must expand* and *not contract the gold.* (*c*) If great density "has been had all along its peripheral, the succeeding central pellets "might be just as much a wedge as those the doctor proposed to finish "the margins with, with the additional advantage of cohering on all "its sides. (*d*) If there are any doubts of a sufficiently close union "with the margins, a smooth point and mallet, when the cavity is just "full, will settle all doubt. (*e*) Again, if the peripheral be kept higher "than the center, as we advance we have a ring next the margin being "continually lengthened by its increasing density, and therefore press-"ing harder and harder against the walls. (*f*) If the cavity was "circular,—and it would be generally somewhat so in the cavity "named,—the last pellet placed in the center of the concavity of the "plug, if drawing up under pressure,—and there is no need of its doing "so,—could not draw in the margins, because the contractions would "be against arches."

I have quoted my reviewer's entire article seriatim, as far as it has reference to his method of filling "these cavities," in order that the reader may see whether I misconstrue or pervert his meaning; and have, for my own convenience, *lettered* each sentence.

In defending the theory touched upon in my essay, I must necessarily point out what seems unsound philosophy in the conflicting one.

If "force upon the center of a very poorly condensed filling does have a tendency to draw it from the walls" (sentence *b*), when do we arrive at the degree of density where this tendency is *reversed?* Will not the same effect be produced even "if the plug is condensed all the way, each pellet from the bottom," only in a lesser and perhaps imperceptible degree? It is these imperceptible spaces between large cohesive fillings and their walls that in time admit the insidious destructive elements.

Again, it seems to me that by "continually lengthening the ring" (sentence *e*), there must be a continual change of place in the gold next to the walls. This, of course, would be slight, but would correspond with the increasing length of the ring. If the condensed ring is made more dense, and at the same time lengthened, it would not be as perfectly adapted to the sides of the walls as it would have been if this slight change of place in the gold had not occurred. If the circumference of the ring has been enlarged, this enlargement has not been contemporaneous in all its parts. It must have been lengthened in sections; and these sections must be as numerous, at least, as the face of the plugger is less than the circumference of the ring. This being the case, there must be a slight movement of the "ring"—hard ring—upon the surface of the walls, as every stroke of the mallet increases its length. If this force could be applied to all the parts of the ring at the same instant, and if the ring had not previously become too dense to be accurately adapted to the walls, and if the gold had lost entirely its elasticity, this practice would not be objectionable.

In reading over sentences *c* and *f*, I either misapprehend the writer or they are antagonistical. For in one (*c*) he makes the pellet in the center of a concavity act on the principle of a wedge,—the force being from the center towards the circumference; in the other (*f*), which is a similar case, the pellet in the center draws from the circumference to the center, but "cannot draw in the margins, *because* the contractions would be against arches."

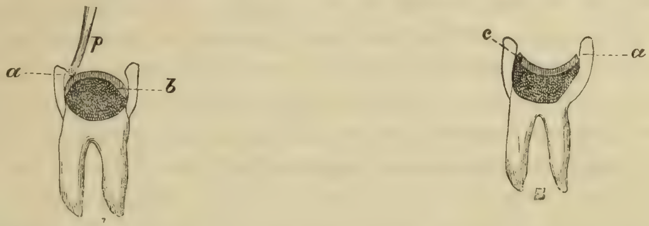
But after all, when we take away the stumbling-block,—the union of the pellet and plug by the first intention,—which it has been seen has nothing to do with this subject, I am unable to see why my proposition in the essay, if correct in principle, should, as he intimates it would, overthrow the ground-work and principles which he has been taught; for he says: "It is very clear that small pellets may be forced down along the peripheral, which is lower than the center, and a good margin made, provided the pellets are small enough, and the angle into which they are driven not too acute."

There is no conflict of opinion here between us. His qualifying clause does not affect the main proposition. If good *margins* can be thus made, "it is very clear" that the gold can be adapted to the walls, at every step, from the bottom of the cavity by maintaining a similar convexity of the plug all the way.

Now for the provisional clause. The conditions to be observed in making a good margin, as set forth in the above quotation, are very simple; so simple (and *correct*) that any ordinary dentist could not fail to make good margins. They are,—to make the pellets small enough, and the angle into which they are driven not too acute.

But there are points upon which we widely differ. To illustrate our adverse theories, let us take a section of the lower molar cut transversely.

The drawing is not very perfect, but is sufficiently so for demonstrating the variant principles. Figure *A* shows a partially filled cavity on the principle advocated in the essay referred to; the central portion being higher than the peripheral. It will be seen that the pellet *a* (or a lightly-rolled cylinder, if you please) may be forced, driven, or *wedged* into the space between the filling and the walls so that it will remain in absolute contact with the walls, and that any amount of force applied in this direction would have no tendency to draw the gold away from the walls; but, on the contrary, would crowd it still tighter against them. By keeping the filling continually higher in the central portion, we are able to thus fill against the walls from the base of the cavity up to the margins; though, of course, this is not essential in the lower portion of the cavity.



a represents a pellet or cylinder; *p* the plugger; *b* and *c* the detached sections of the filling.

Again, the force applied upon the center of the plug could not draw the gold from the walls of the cavity. Suppose, for example, after the cavity is half filled, and the gold properly condensed, we are able to detach a section from the upper part without otherwise disturbing it, as represented in the cut, and between this and the remaining portion of the filling be placed a strip of tin foil so that the parts cannot again cohere. Now, what will be the result if we recondense the filling? Will the upper section be drawn from the walls? It seems to me that its tendency would be the very reverse. And does not this section indicate the *tendency* of each succeeding layer? But how would it be in case a section be similarly detached from the concave filling *B*? Obviously the peripheral portion would be drawn nearer to the center, and the more it was malleted the more would the edges curl in towards the center.

I may have represented the filling in Figure *B* more concave than Dr. Hunter would approve in practice, but the principle is the same; and it certainly is not as concave as some teachers in our colleges recommend.

Now, before concluding this, I fear, already too lengthy article, I am constrained to examine the sentiment contained in sentence *d*, for I consider its teachings both fallacious and dangerous. The writer says: "If there are any doubts of a sufficiently close union with the margins, a smooth point and mallet, when the cavity is just full, will settle all doubt."

The cavity he speaks of is a large crown-cavity, filled with cohesive gold. After it has been filled (and condensed, of course), he claims that the smooth point and mallet will solve all doubts in regard to the sufficiently close union of the filling and margin. Of course these spaces are *imperceptible;* were it otherwise, the application of this test would be superfluous. Now, will this operation make these spaces more perceptible? In a tolerably good filling I should say not. The plugger might, however, penetrate a very poor filling at the margin, but this would only solve the question of its density. But a thoroughly compacted filling, in which "the *ring next the margin* has been continually lengthened by its increasing density," would not reveal these imperceptible spaces—if they exist—by the application of the force and instrument named for that purpose. The *surface* of the periphery of the filling might thus be drawn against or over the margins, and these spaces bridged over with a thin layer of gold, which, if not removed in the process of finishing, must soon be worn away by attrition. I therefore consider this method of detecting or obliterating these spaces at the margins, to say the least, a very deceptive one.

My apology for this lengthy paper is—the importance of the subject. While we now possess greater educational facilities, and work with much improved instruments and materials, and expend more labor and skill than our predecessors did, or than we did ten or fifteen years ago, I fear our operations are not proportionably as superior as are our advantages. It is true that quite a large class of operators, by their great skill and indomitable energy, have arrived at a high state of perfection in their vocation, and are producing fillings that defy the closest criticism, and likewise stand the test of time; yet, there is again a much larger class of painstaking operators who are doing work *seemingly* as good as the best, but which soon shows signs of failure at the juncture of the gold and margins of the teeth.

At the present day, when cohesive foils are so extensively used, this point—in very large fillings the most important one of all others—is the most vulnerable, and requires the closest thought on the part of the operator. For this reason the simpler (which is always the more philosophical) and easier method of filling such cavities should be sought and practiced.

IVORY POINTS.

BY T. D. SHUMWAY, PLYMOUTH, MASS.

(Read before the Massachusetts Dental Society at the regular monthly meeting, February, 1872.)

In manipulating gold foil in filling teeth, there are two principal considerations. The first of these is adaptability, and by this we mean a suitableness or fitness in the relation the gold is made to sustain. The second is solidity, and by this we understand that the material introduced to supply that which decay has wasted shall be of sufficient strength and hardness to resist the action and perform the work the original was designed to do. How best to secure these two conditions is the question, the solution of which has led to the various methods now commonly known to dental science. There are also different forms of preparing the gold, that to the minds of some furnish the key that solves this problem.

In the discussion of this question, it is not our purpose, only so far as becomes necessary for a clear comprehension of the position we assume, to point out objections to any of the established methods. Neither is it our purpose to answer the objections which may be urged against our own, but simply to state in as brief manner as possible some of the claims this method and these instruments have upon the attention of the profession.

That our position may be as clearly stated as possible, and also to answer the inquiry, How would you introduce foil with ivory points into a certain cavity ?—viz., an approximal cavity in one of the incisors perhaps just large enough to admit the head of a pin,—we will, in passing, remark: 1st. That gold cannot be manipulated with ivory unless it be cohesive. Recognizing this fact, there must of necessity be a base or starting-point around or upon which to build. Cavities like the one just mentioned are not large enough to admit of retaining pits or starting-points, and in all such cases the cavity itself must be the base, and the gold must be "wedged" to retain it. 2d. Ivory points are not pluggers, but are designed for packing gold. 3d. They are not burnishers, for gold cannot be burnished with ivory.

In order to secure the most perfect adaptibility, it is important that the malleability of the material be preserved. Gold, when pure, possesses this property above all the metals. It has also an affinity for the other metals, so subtle that even contact will render it brittle and intractable. Its susceptibility to external influences is shown in the fact that the vapor of lead destroys its malleability. The goldbeater, cognizant of this affinity, never allows iron to come in contact with gold during the beating process. His success depends upon preserving its malleability.

Pure gold being the most dense of all the metals except one, is, when beaten into thin sheets, and its crystals or granules thoroughly laminated, of sufficient density for all practical purposes to the dentist. Being endowed with the property of uniting with itself, forming one solid or compact body, it needs only contact to bring it into its closest relationship. This union of the particles takes place at an insensible distance, and is in obedience to the law of attraction of cohesion. Attraction is the return of variety to unity. Cohesive attraction is the return to unity of molecules or particles of the same kind. It is the aggregation of homogeneous particles.

There are various kinds of aggregation: the solid, soft, liquid, and gaseous. A piece of marble, for instance, represents the first kind.

The atoms of which it is composed are held together in obedience to the same law as the grains of gold. There are certain elements that are opposed to, or which prevent, cohesion. Among these may be mentioned, first, mechanical force. As an illustration, if we take a hammer and break the piece of marble, it is mechanical force destroying or disintegrating the mass. Precisely the same effect will be produced upon a nugget of gold. But, unlike the marble, it possesses the property inherent of reuniting under certain conditions. It is because this principle is recognized that gold plates are frequently annealed in wedging for artificial teeth. If we submitted a piece of gold-plate to one-twentieth part the hammering that many a gold plug has been subjected to without frequent heating, we would not expect to find anything left of it—and rightly, too.

Why, then, should we, in introducing gold into a cavity in a tooth, treat it so radically different from what we would under other circumstances?

Chemical action is another force that is opposed to cohesion. The action of affinity is always accompanied with a change of properties to a greater or less extent. To my mind, when applied to the metals, the term chemical mixture best defines this action of affinity. It is not a mechanical mixture, as no force has been employed to form the combination. As the vapor of lead destroys malleability, and as we have endeavored to show that contact with iron sensibly impairs this property, we see no reason why these elements may not mix chemically, and prevent cohesion. As another proof of this mixing, we will mention the purple hue in so many cohesive gold fillings, showing the presence of the oxide of gold. Mechanical action being opposed to cohesion, interlacing the mats of gold with the mallet or by hand pressure impairs the natural union. If anything is brought in contact with the gold that affects or destroys its cohesive property, it must be interlaced. Steel, by its affinity, does affect both the malleability and cohesion, by changing the nature of gold, and force then becomes a necessity if steel is used in manipulating.

Our attention has recently been directed to smooth pluggers, in which we are advised to make haste slowly. We are also informed that the instrument must be carefully made, so that direct application shall be possible in every sort of cavity, etc.

We confess our disappointment at seeing this announcement, not only as evidence that the true principle was little understood, but that the advice would only tend to discourage or mislead.

In the first place, no instrument can be constructed that will admit of direct application in all sorts of cavities, or that can be applied directly throughout hardly a single operation.

Every dentist would feel at once as though his mode of operating was being narrowed into a very small compass, and that he himself was in a strait-jacket, should he be compelled to adopt any such method. A smooth-faced plugger, be it ever so carefully formed, if it be made of steel, will slip under the force necessary to consolidate gold foil.

The first step to be taken in the application of the method we advocate is an understanding of the difference between cohesion and mechanical union, and also, so far as can be ascertained experimentally, the action of chemical affinity.

The next is a disregard of many of the terms that are employed in describing all of the various methods for manipulating foil. Among these may be mentioned, first, burnishing. A burnished surface is not favorable to aggregation. The reason for this is, its hammer hardens the surface, which prevents cohesion. It is from this cause that burnished surfaces scale off. Another is, condensing or consolidating. The goldbeater has already performed this work, and any further attempts to increase its density, except by the same process, only tend to disintegration. The next is welding. The process of welding is a uniting with intense heat. The union of gold does not depend upon heat. Heat is only employed to perfect the conditions by which cohesion is possible. The union takes place just the same if heat be absent. Another is pressure. These weak, slender points are designed for the gentlest touch and the most delicate handling, and until the mind has been rid of all idea of force in their application, they can be of no possible service. But we know the difficulties in the way in attempting to eradicate what has become by constant practice a part of our nature. It is the first instruction given to the student, and he builds his whole theory upon this foundation.

In our leading text-book, the author says, "that for introducing gold a number of instruments are required which should be of sufficient strength to resist any amount of pressure." We are not surprised to find advocates for forty-ounce mallets, for with such expressions one would naturally infer that the force should only be limited to the power of endurance of the patient. The terms we have referred to are considered to be the thing itself. Expunge these, and what is there left? Almost the first question asked by the dentist not familiar with ivory points is, "Are they to be used with the mallet or by hand pressure?" showing that such a thing as manipulating gold foil without condensing it was a philosophy of which he never dreamed.

One word as to the form of preparing the gold, to which we have before alluded.

In our experience we have found it well to consult form only so far as regards convenience. What we are to seek first is condition. Gold, if pure, possesses the cohesive property, and the form, whether it be foil, twisted, in cylinders, or pellets, or the different kinds of crystal gold, is all the same. If anything is allowed in contact with the gold for which it has an affinity, cohesion will not take place, whatever the form may be. What merit, then, does ivory possess over other material? and why is it adapted for packing instruments?

In the first place, ivory is the most elastic of all known substances. There is no substitute, where extreme elasticity is desirable. It is for this reason that billiard balls are always made from it.

Elasticity in the instrument employed for packing gold is a necessity, for if you work the foil arbitrarily it becomes stiff, hard, and unyielding. An instrument so constructed as to give the least possible resistance preserves the softness of the material, and is thus the more readily adapted to its position.

Then, again, when it is once in place, it should never be drawn away or removed; therefore the instrument should be designed with a view of avoiding, so far as possible, danger from this cause. A blow or a thrust imperils the whole operation, while a gentle motion adapts the gold to its position, and there it remains undisturbed. It is also well suited for the purpose, being free from any of the objections urged against steel.

Ivory has no natural affinity for gold, and therefore it cannot change its properties by chemical attraction, and contact will not affect its malleability. Force being opposed to cohesion, the instrument should be so constructed as to prevent the exercise of it unduly. Ivory is very brittle, as well as exceedingly elastic, and the employment of force adequate to destroy cohesion is usually sufficient to break the point. Thus, you perceive, the one conserves the other.

We have been pleased to notice the commendations this method has received as being of value to susceptible patients, and in positions not exposed to wear. If our position is correct, that cohesion is the strongest possible union, it certainly should be considered safe to trust it in unexposed places. But we believe it is safer to trust to a natural union than to any mechanical interlacing, in all cases and under all circumstances.

If we preserve the malleable condition, we secure a more perfect adaptability, and by its softness a greater density, and being free from porosity, it is not as liable to be affected by moisture. Soft gold wears better than hard, for if it is hard it must be brittle, and in many instances will break and crumble away, while if it is soft and malleable it takes kindly to its position, and in use its wearing is more uniform.

But we certainly have no cause for complaint. If your indorsement has been withheld, we have received kind and encouraging words from many in the society, which will not soon be forgotten. What we offer you we believe has intrinsic merit.

We could mention special cases which as golden monuments attest the practical value of this theory. Let us explore this broad field so rich in promise, and from it may be gathered greater possibilities than any yet attained.

EXPOSED DENTAL PULPS.

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(Read before the Odontographic Society of Pennsylvania.)

THE paper by Dr. Jack read at our last meeting was, as you then decided, of sufficient importance to delay any discussion upon it for one month; after such action on your part, for me to make complimentary reference to it would be decidedly superfluous. The society I trust will pardon me if I attempt to add a few remarks to that subject, already so ably treated.

The discussion of the operation of "capping exposed pulps" has been continued for years, and, as you are all aware, is by no means new or recent, for we find that Hippocrates* is supposed to have borrowed from the Egyptians the practice of cauterizing the pulps of teeth and using cements. Marcellus also advises cautery and stopping with gum.

Coming to a more recent date, Dr. L. Koecker,† in a work published in 1826, advises attention to diet, the actual cautery, and stimulates externally with myrrh, camphor, and opium, to reduce any inflammation of the gums.

In 1829 was published Dr. Fitch's‡ work, in which he recommends astringents, alum, borax, and Aleppo gall, and says this application should be renewed every ten or fifteen days for several weeks, or even months.

Mr. Bell§ used stimulants, such as alcohol and spirits of camphor, for the treatment of cases of exposure of the dental pulp.

Dr. Harbert|| soldered a gold tube to the cap, so as to allow a discharge from the pulp to pass through the filling without injuring it.

Mr. Robinson,¶ of England, used collodion with morphia, and after the first drop flowed over the pulp had set, he filled the cavity with asbestos, saturating this with collodion. He prepared the tooth by wash-

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*Snell. "A Practical Guide to Operations on The Teeth." Philadelphia: Carey & Lea, 1832. Pp. 10–20.

† "Principles of Dental Surgery," etc., by Leonard Koecker, M.D., etc. London, 1826. P. 432 et seq.

‡ "A System of Dental Surgery," by Samuel S. Fitch, M.D. 1835. P. 380.

§ "Anatomy, Physiology, and Diseases of the Teeth," by Thos. Bell, F.R.C.S., etc. 1837. Pp. 153–4.

|| "Surgical and Mechanical Dentistry," by Samuel C. Harbert. 1847. P. 67.

¶ "Dental News Letter," April, 1849. P. 66.

ing with warm water in which a few grains of bicarbonate of soda had been dissolved.

Dr. W. W. Codman* cleansed as if for filling, then protected with cotton, occasionally removing it and slightly rescraping the bone. He advised that the tooth be filled *after* the deposit of dentine had taken place; a practice that would still be sure to prevent the removal of permanent fillings or the awkward admission of failures of such treatment.

I. B. Branch,† of Galena, reports a case where he seems to infer that the bulbous portion of the pulp exposed by the fracture of a tooth became ossified (dentinified), and projected beyond the line of the fracture.

Mr. Tomes‡ advises a mat of gold where the opening is small; but if much decomposed dentine exist around the opening, a piece of quill should be shaved down until flexible, softened in warm water, and then laid over, carefully completing the filling with amalgam.

Thomas Rogers,§ in a very able paper "On Capping the Exposed Pulps," differs from the above practice by using a plate of gold, held temporarily in position by gum mastic, over which the amalgam is inserted, taking care not to displace it.

Dr. Harris§ thought that eleven out of every twelve could be saved. He used a gold filling without cap, but built up arching over the pulp.

Dr. J. H. Foster§ describes his mode as lining the inside of the cap with what he calls Hill's vegetable stopping (gutta-percha), and thinks it better to complete the filling with the same material.

Perhaps, while recounting the various plans, it would be well to mention that of Dr. Hullihen,§ as one that would be only practicable at the hands of very skillful operators; it was performed by making a coil of gold wire into a spiral spring for the cap to sustain the filling, and finally drilling under the gum through the neck of the tooth to the pulp cavity.

Dr. Elliot,§ of Montreal, advanced the opinion that any space left vacant under the cap was liable to permit the pulp to protrude through the opening, and the nerve was thus irritated and wounded; he therefore used asbestos rolled in gold foil.

Mr. Spencer Bates§ practiced with ivory caps.

Dr. C. A. Du Bouchet§ used horn prepared by softening it in hot water.

Mr. Bridgman§ is quoted as using a plate with a hole in it, so as to put it in place by an instrument inserted in the hole.

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* "Dental News Letter," April, 1851. P. 90.

† Ibid., October, 1851. P. 214.

‡ "A System of Dental Surgery," by John Tomes, F.R.S., etc. Philadelphia, 1859. P. 473.

§ Transactions of the Odontological Society of London, 1858. Paper read July 6th, 1857. P. 131.

Dr. Codman,* of Boston, by using cotton, and refilling daily for from eight to fifteen months, at least avoided the danger of dismissing his patient before he must have made a somewhat familiar acquaintance with the appearance of the cavities, and probably did not carry many ordinarily impatient sufferers through the entire course, without the expression of a profound willingness on their part to be relieved by some more summary if not so scientific a method.

Dr. Allport, of Chicago, devised the delicate operation of excising a portion of the pulp and bringing the edges of the wound into close apposition, thus obtaining healing by first intention, and slightly reducing the bulk of the pulp.

Drs. Harwood, Dwinelle, Codman, and others, agree that calcification or dentinification takes place in some, if not all, cases of exposure that have been successfully treated by capping.

In February, 1861, Dr. J. Richardson† recommended bleeding, and covering the exposed pulp with oxychloride of zinc.

In March, 1869, Dr. Sanford‡ writes that he uses cork over the pulp.

Dr. C. E. Francis,§ of New York, in October of the same year, mentions letter-paper saturated with carbolic acid, for actual contact with the pulp, and oxychloride of zinc over this. In my own practice this method seems to be quite fruitful of success, compared with the others already mentioned. I have at times filled without a non-conductor, when the opening into the pulp-chamber was very small and the floor of the cavity thick and firm.

In addition to the articles already named, there have been recommended for years, by different operators, oil-silk and a solution of gutta-percha in chloroform.

A careful study of the question of exposed pulps would lead us to ask, What shall we consider an exposed pulp? Upon the answer which shall be given much may depend; indeed, the entire difference, both in the treatment and the reports of successful cases, will almost entirely hinge upon this point.

It certainly may be true that a perfectly sound vital pulp, in a tooth that is intact, is *exposed* to irritation when either extreme of temperature is applied for a time to the tooth. Or we may allow, that if any osmotic action will take place through the dental structures, fluids in the mouth of different density from the serum within the tooth, and of an irritating character when applied to the pulp, will also prove it to be exposed in the above sense. Galvanic currents, or even changes in the function of circulation, might all be enumerated as so many cases of *exposure* to irritation; therefore it seems to be well that some definite conclusion should be arrived at, as to what shall be considered an *exposed pulp.*

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* Transactions of the Odontological Society. Ibid.

† DENTAL COSMOS, February, 1861. Vol. ii.

‡ DENTAL COSMOS, March, 1869. Vol. xi.

§ DENTAL COSMOS, October, 1869. Vol. xi.

Owing, however, to the difficulty that appears to exist in arriving at any true conclusion, we may look for its use in dental writings under somewhat similar, or analogous conditions. We do not find enamel spoken of as exposed when covered by a layer of salivary calculus; nor in filing and chiseling is dentine exposed, when covered by the thinnest possible layer of enamel. Indeed, when the enamel is diseased or disintegrating through its entire thickness, it is not customary, so long as it is in its normal position, to say that the dentine is exposed. The same may hold with regard to the neck of the tooth when covered by the free margin of the gum, and again of the dentine underlying the cementum, where the root is uncovered, by the removal of the tissues that ordinarily cover it. May we not even go further and ask if the pulp is considered to be exposed, when the first substance laid over it in the operation of capping, as paper, oil-silk, collodion, etc., has been applied?

If it be true that a pulp is not exposed after the inner cap has been applied, neither can it be a correct term where there is a covering of an unbroken layer of dentine, although it may be as devoid of vitality as the quill-horn or leaden capping, and punctured by hundreds of tubuli. The common expression used in describing the operation is, "removing the diseased dentine exposed the pulp."

Teeth have been so filed, cut, or broken as to make them sensitive to pressure, or thermal changes, and require temporary coverings; but such are not exposed pulps. Nor should fillings that are placed in ordinary cavities in the dentine, to protect the teeth from further disease and the pulps from painful impressions from without, be quoted as successful results in pulp capping.

Webster defines "exposed" as "laid open; laid bare; uncovered; unprotected," etc.; and, after considering the above objections and reasons, may it not be well to definitely understand that *an exposed dental pulp* is one so completely uncovered as to be in direct contact with the fluids and atmosphere of the mouth through an unnatural opening into the pulp-chamber, large enough to be visible to the naked eye?

While aware of the value of time, it still is hoped that it is not ill spent in arriving at a universal understanding of a term which would admit of such latitude in its use as to completely destroy all value of the data published, or quoted by our authorities.

To my friends, Drs., Jack, Peirce, Nones, and Breen I am indebted for reports of cases which I have attempted to tabulate as follows:

Capped Pulps.

	FAILED IN				SUCCESSFUL FOR				REMARKS.			
	1 m.	3 m.	6 m.	1 yr.	3 m.	6 m.	1 yr.	over 1 yr.	over 3 yr.	Totals.	Failures.	Successes.
Thin layer healthy dentine......		3				5		6	4	18	3	15
" " unhealthy dentine...				9				4		13	9	4
Exposed pulps..........................			2				5		3	10	2	8
" " and bleeding.......			8				2	4		14	8	6
Previous odontalgia.................			5									
No previous odontalgia............										55	22	33

Table.

Of 258 Patients,—141 Females, 117 Males.

2282 fillings deep caries.
174 filings super. "

2456 ÷ 258 = 9½ (nearly) average caries per patient.
* Teeth pulp cavities filled 150 ÷ 258 = ⅗ (nearly) average per patient

	FAILURES.							SUCCESSES.								
	1 month.	3 months.	6 months.	1 year.	2 years.	3 years.	Total.	1 month.	3 months.	6 months.	1 year.	2 years.	3 years.	4 years.	Total.	No. of cases.
Thin layer healthy dentine..............................	2						2	1		2	4	1			8	10
" " unhealthy dentine..........................	7	2		6		1	16	1		7	7	1	2		18	34
Totals..	9	2		6		1	18	2		9	11	2	2		26	44
Exposed pulps..	3	3		2	1		9	1	1	2	6	5		1	16	25
" and bleeding pulps............................				1			1	1				3	†2		6	7
Totals..	3	3		3	1		10	2	1	2	6	8	2	1	22	32

* Of successes in capping, 22 out of 32, nearly 2 out of 3.
Or " 22 " 160 " 1 " 7.

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* A large proportion of these pulps were found dead, upon the first visit of patient.

† Filling of one, a superior lateral incisor, removed after six months; pulp bled again, and filled with gold, as before, without a non-conductor. The other, a superior wisdom, had bulbous portion of pulp removed, and that in the root canals allowed to remain,—filling, oxychloride of zinc.

Since writing the above, I have the following cases to report, viz.:

1st. Superior Wisdom. Small opening, discolored and soft dentine. Nervous temperament, male, aged 40.

2d. Inferior Second Molar. Small opening, discolored and soft dentine. Gutta-percha. Nervo-lymphatic, male, aged 21.

3d. Inferior First Bicuspid. Small opening, discolored and soft dentine. Amalgam. Nervo-bilious, female, aged 18.

From the testimony furnished by the various writers, it is evident that here, as is too often the case with operations, the local treatment monopolizes the attention of the operators; and the important considerations of the general system, its ability to withstand the effects of irritation, and the greater or lesser tendency to inflammatory action, the proper antiphlogistic regime to be regarded, and the consequent prognosis that should always be formed in each case, are neglected. When we remember the cases reported of the two Africans, one with his skull fractured by the war-clubs of his enemies, and the other with an arm mangled, the bones and muscles being literally crushed by the teeth of a lion, both within a few hours being able to attend to their daily duties and discharge the extra responsibilities of members of a council of war; we cannot feel astonished that in some persons almost any treatment may prove successful. On the other hand, however, we find many who, being among those more fortunate as to their mental endowments and less blessed in their animal vitality, are irritated to feverishness by a seam or darn of their stockings, or who will have chills from mental states dependent upon imagination. Between these two extremes we find every possible shade or diversity of being, and consequently the most numerous forces bearing upon the method of treatment and the final result to be expected. To read the reports of some of the successful cases would almost cause one to question whether the aforesaid aborigines, with their pristine "*vis medicatrix naturæ*," could have withstood the remedies and mutilation under which the unfortunate patients seem to the writers to be unconcerned and happy.

The temperaments that would seem to be most favorable to the operation would be the phlegmatic and bilious; on the contrary, those most opposite, the nervous and sanguineous, are the least likely to admit hope of success.

Previous condition of the parts should also be taken into consideration. It is a well-known law in pathology that parts having been once inflamed are more liable to a return of the trouble, and it is an almost universal experience that this is true of the dental pulp.

From all thus gathered, it must be evident that the diversity, of the toleration of the operation, is very great in different patients, some

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4th. Superior Wisdom. Medium opening, discolored and soft dentine. Gutta-percha. Nervo-bilious temperament, male, aged 23.

5th. Superior Second Bicuspid. Small opening, healthy dentine. Gutta-percha. Nervo-sanguine, male, aged 25.

The last case removed after 25 days' wear. Recapped, and this removed. Now under treatment.

No. 3 had six dead pulps when first seen.

During this time, have had to treat a number of teeth with pulps already dead.

being always comfortable with capped pulps and others the reverse. Indeed, it may be regarded as an excellent rule that, inasmuch as like causes produce like effects, where a patient has one dental pulp successfully capped, others may be similarly treated with considerable certainty of success, if the individual conditions are the same at the subsequent operations as at the first.

Bearing, however, upon the condition of the part exposed, there certainly are many more favorable results in recent exposures; and where the partition of the dentine intervening between the cavity of decay and the pulp is most healthy and thickest and the opening smallest, we may, other things being equal, look with greatest certainty for a cure. This would seem to indicate that carelessness in excavating will, by unnecessarily uncovering pulps, give a proportionately greater number of successful cappings.

Again, it may be that the exact diagnosis of an exposed pulp is not known, or, being understood, not scrupulously practiced, by those who unhesitatingly cap all such cases. Often sensitive dentine leads the patient to think the pulp exposed, when in reality the cutting is only on the peripheral layer of the dentine, and, under such circumstances, many teeth thus filled might be readily mistaken as furnishing encouraging data for the indiscriminate practice of pulp capping.

Finally, it would not be satisfactory to the scientific investigator to pass without notice the very important effects of food and climate. Some sections of this country are already famous for the production of diseases due to deposits of lime in the system; where the water is strongly impregnated with this substance, lithotomy is understood to be most frequently demanded, and among the calcified pulps it is notable that, of those specimens in the museum of the Philadelphia Dental College, the major part are from the same sections of our country.

The water of this city, as is generally known, contains a little sulphuric acid, and what lime is poured into our Schuylkill River is generally united with a portion of the former, as it is brought down from the coal regions, where the decomposition of the iron pyrites forms this powerful acid in sufficient quantities to render the water of the streams deadly to fish, and so corrosive as to forbid its use in the boilers of the steam-engines and factories that are in that locality. New leaden pipes, leading this water through our houses, are quickly lined with a sulphate of that metal, due to the free sulphuric acid, which remains after the lime has been converted into gypsum (sulphate of lime) near the mouths of the streams, that, after traversing the limestone districts, empty into the main river.

Variations in the climate, which in the spring and fall are so sudden and dangerous here, are also very unfavorable to the permanence of the health of capped pulps, and the records show a number of deaths of dental pulps at such times.

It would seem that the pain inflicted, the general disturbance caused, and the wear and tear of the system, would be less if pulps that are exposed by caries should be invariably devitalized. To this, however, we may add that in the few exposures of the pulp that result from unexpected movements of the patient, abnormal shape of the pulp, or carelessness on the part of the operator, it would be well to relieve the pain and fill immediately over a cap. Even in the latter cases, since they bear so small a proportion to the whole number of fillings, it would seem to be less of an error to extirpate every exposed pulp than to *indiscriminately* cap all. The above only applies to those ignorant mechanics who, without education or judgment, wish invariable rules, and disgrace themselves by practicing our profession as a common trade.

In the classes of thin layers of dentine, healthy and unhealthy, on the contrary, many have not been noted, and it would seem to be the proper mode of treatment to invariably give such teeth the benefit of the doubt and place non-conductors under the fillings. These do not properly come within the true meaning of exposed pulps, and for years reputable operators have endeavored to save them by protecting them from irritation. There is one reason for capping pulps that, whether it be true or false, should never be of sufficient weight as an argument in favor of the operation; this is, that there is less trouble to the operator, and it makes temporary fillings oftener necessary, and hence by their frequent replacement a more remunerative practice.

Of the material used for immediate contact with the pulp, it would seem that thin slices of periosteum, or cartilage, might be used with more scientific reason than many of the articles heretofore named.

GOLD IN TEETH.

BY E. W. FOSTER, MILWAUKEE, WIS.

It will not be denied, perhaps, that a large number of teeth filled with gold by the average skill and intelligence of operators are lost, sooner or later, and that others, after fruitless attempts with gold, are finally saved for years of usefulness by the use of some of the baser metals and materials. Facts are often humiliating, and the testimony of many might be had whose observation would doubtless be, that gold as a filling for teeth, in all their wants and conditions, is only relatively successful in the hands of the best operators. Though gold, applied with skill and circumspection, is undoubtedly the best material in most respects for filling carious teeth, yet it has grave faults, which, together with imperfect methods of introduction, lack of skill, and ignorance of principles governing the preparation of the cavity, must undeniably account for the large number of failures charged against it.

Many cases have been observed in which failures are not directly traceable to the operator. These are most often found among six-year old molars of children and youth, and in many bicuspids of adult females, and occasionally those of adult males, which are predisposed to dissolution by caries, from causes in a great measure internal and inherent. Teeth in this condition belong to the class pointed out by Tomes, Huxley, and other physiologists, as having imperfect cell structure, which will justify us in seeking for the solution of the problem of many failures of gold filling in the structure of the teeth themselves.

Such teeth under the excavator cut soft in almost every direction; and the fluids they contain, by chemical reactions, enhanced in the abnormally large interglobular spaces, will seldom fail to attack, more or less, the inclosing walls. Similarly, spaces left between the filled cavity and its gold plug, although the latter has been put in with much care, will be the cause of a constant deterioration; hence annoyances and failures which may not in common justice be due to the operator. It is such cases, baffling so often the best intentions, that will form the subject of the considerations that follow.

As above remarked, the filling itself, as often inserted, may become a powerful assistant to disintegration, by leaving vacuums between itself and the walls of the cavity; vacuums acting most probably like abnormally large cells in the dentine, and holding stagnant liquids which were once, in health, intended by nature to move in circulation, now reacting upon themselves, according to chemical laws. Many, no doubt, will sustain the observation that plugs of sponge gold most frequently present the example of such disintegration when they were apparently well condensed and tight at the borders. Both annealed and heavy-numbered gold foil, worked with serrated pluggers and compacted with the mallet even, show under the glass undeniable imperfections upon the entire surface of the metal. It would follow, therefore, from this hypothesis, that it is not enough that the gold plug be solid in a general sense, but it must perfectly adapt itself to the irregularities of the cavity, in order to lessen the vacuums otherwise produced with the consequent chemical reaction of dormant cell contents.

We hold it, therefore, not improbable that, under such faulty conditions, the plug also may undergo more or less deterioration from the effect of solvents. By the analysis of the dentine, as made by reliable authors, it is found to contain a percentage of fluoride of calcium. The liquids in circulation through the dental tubuli, having to feed and to replace waste, most certainly hold in suspension the elements of the entire composition of the tooth, and therefore contain some fluoride of calcium. The latter will be in an exceedingly small proportion, it is true, but when we reflect that very small quantities of fluorine, free, or combined with hydrogen, form hydro-fluoric acid, which attacks with energy almost all bodies, gold included, may not one of the sources of failures above reported be traceable to the presence of fluoride of calcium, which may be decomposed by causes not at present well understood? This supposition might be confirmed to a certain point also, by the fact that failures mostly, if not exclusively, have been, as we have said before, observed in the teeth of youth and women of delicate constitution, whose teeth analysis shows to contain a much greater percentage of fluoride of calcium. The history of fluorine is very imperfectly understood at present, on account of the impossibility, thus far, of obtaining this body in a free state, and studying its properties. Yet, the little which is known of it gives us the right to ascribe much to fluorine in chemical disintegrations.

The plug, under this condition of things, has been observed, even with the appearance of a close border, to sink, after some time, into the cavity, which fact may be attributed to the enlargement of the cavity, or to the diminution in size of the plug, or perhaps to both of these causes.

Could not also the great conductibility of gold for heat be considered as helping the disintegration of dentine? It is an undeniable fact that most of those whose teeth are filled with gold have suffered, more or less, from their teeth being sensitive and even painful. This constant communication of the delicate, inner nervous fluids of the dentine, with all the changes of temperature from without, most certainly, and more especially in teeth predisposed to decay, has a pernicious effect. And it is also a common observation that when the plug is deep-seated, as often happens, the pulp dies, and carries in its fate other portions of the dental structure, which, some time later, is shown by the darkened appearance of the enamel. Furthermore, to insert a body like gold, of the highest conductibility of heat, into the inner portion of the tooth, among the elaborate workings of its vital organism, without preparation, shows at least a high disregard for the teachings of nature, which has protected the dentine with an almost perfect non-conductor,—the enamel.

According to microscopic examination, the dental tubuli empty directly upon the walls of the cavity, with mouths of greater or smaller diameter. It is therefore obvious that the plug which will most perfectly adapt itself to the walls of the cavity will most effectually stop the ends of these canals, thus making *culs de sac*, into which inorganic matters now being brought forward in excess of action to contend against the encroachment of caries,—just removed by proper excavation,—will be deposited against the plug.

Calcification has now commenced, by which, when perfected, the tooth will be, in a large measure, isolated from the effects of the conductibility of the plug, and other things being equal and normal, the tooth will be saved.

As to the kind of gold and method of its introduction, that will best meet the results of a perfect plug, we leave to the firm hand and clear head of the intelligent operator. Yet we will say, in passing, that the works of the old masters in dentistry, whose labors we often see to-day and point to with pride, used most exclusively soft foil, wedged or condensed outward from the centre. We submit that the principle is a correct one for the end aimed at, and cannot be entirely ignored by those who would emulate them in honor won by their skill and usefulness.

The preparation and treatment of the cavity is of the first importance to its subsequent well-being. A non-conductor, as a medium between the plug and the walls of the cavity, is of the highest advantage. This acts as an arrester to the nervous fluids of the tooth, from the changes of temperature from without, and protects the reparative forces from shock till they can readjust the tooth to its new necessities. To this end gutta-percha, oxychloride of zinc, and other substances, have been used, but have not been successful in all cases. We have for a long time considered that something which could be applied to the surface of the cavity previous to the introduction of the gold, and used in the convenient and efficient form of a fluid, or semi-fluid, would be the most desirable, if, at the same time, it met the demands of the case.

The hypophosphite of lime, which we had opportunities to use with perfect success—we have reasons to believe—seems to us to fulfill all the requisite conditions. Its application is easily made in a fluid or semi-fluid state. It introduces into the ends of the tubuli a salt, which is shortly transformed into phosphate of lime, and so hastens the formation of the protecting and non-conducting envelope over the heretofore naked surface of the cavity, practically glazing and enameling the entire wall.

It helps and anticipates the work of nature, to which it saves its first labors,—labors of weeks and months perhaps in delicate constitutions.

The hypophosphite of lime is nearly perfect as a non-conductor of heat. It severs the communication of the tubuli with the outer temperature, and therefore gold—or other substance, if deemed more suitable than gold—can be used with impunity in most cases, although their conductibility may be very great and their adaptation to the walls of the cavity not perfect. And finally, we may add also, that in the treatment of exposed pulp, and sensitive dentine, it has in our hands produced some of the happiest results.

We have thought it not unworthy to communicate such observations as we have thus far had opportunity to make, satisfied meanwhile if they only prove an incentive for others to direct their attention, or studies even, to a subject of some novelty perhaps, but none the less of great importance to the profession of dentistry and its patients.

ANOTHER METHOD OF PACKING GOLD.

BY THOMAS FILLEBROWN, D.M.D., LEWISTON, MAINE.

The discussions of dental societies, and the burden of many articles in our dental journals, show that quite a portion at least of the profession earnestly desire to be freed from bondage to the mallet, and still be able to avail themselves of the advantages of the cohesive quality of gold. The greatest extremes have been advocated for packing foil, from a pound mallet to a paper-folder; from serrations many lines in depth to a burnisher. The advocates of the former were sure the greatest force was perfect safety to the frailest teeth; while those of the latter are confident that the lightest pressure is all the fragile enamel will bear. To aid in finding the desired point between these extremes, I offer one more method of packing gold foil,—a method depending entirely upon the cohesive quality of the gold for the solidity of the filling, and yet using force enough in its manipulation to render it practical in its application, and sufficiently rapid in its execution. Three qualities are essential in the instruments: strength of material, perfect smoothness of the points, and absolute hardness of the packing surfaces.

Steel best combines these qualities. If frail, the edges of the points will crumble; if rough, the slightest turn of the instrument will tear the gold; if soft, the gold will adhere to the point, and it will also drag the surface, and thus destroy its cohesiveness. Take steel points of such size and form as will reach all parts of the cavity; make them entirely smooth, and the surfaces glass hard. Prepare the cavity as desired; making retaining-points for starting, as for mallet fillings. Absolute dryness is essential; therefore the rubber dam is indispensable. Take good cohesive gold foil, No. 4, and cut the leaves each into five equal strips, and roll evenly and loosely into ropes; then cut into convenient lengths, from one-eighth inch to a whole piece. Have the dam well adjusted, the cavity well prepared and dry; annealing lamp and pluggers in readiness. Then, with small pieces of gold freshly annealed, and a small point, fill the retaining-points, carrying the gold home with gentle, steady pressure, giving the point a slight turn on its axis. When the retaining-points are filled, use larger pluggers and longer pieces of gold, carrying it into every part of the cavity; of course filling the portions most remote and difficult of access; first condensing each layer of gold as it is added to the mass before the gold is doubled on itself. Two to four pounds pressure is all that will generally be required. It is only when the gold needs to be forced into some place not readily accessible, that so much as six pounds will be needed.

Any rubbing of the gold must be avoided; it destroys the cohesiveness of the surface, so that more cannot be added. A turn of the point of five or ten degrees, when the gold is carried to place, is all that can be applied to advantage. If from any cause the gold fails to unite at any point, take a sharp instrument and scrape to a fresh surface; then go on as before. This may be done even during the finishing of the filling.

When the filling is completed, burnish down thoroughly, for the purpose of hardening the surface; for this there is no necessity, but I esteem it desirable. A filling made by this method will retain the softness of the annealed gold, will be thoroughly adapted to the walls of the cavity, and will show no disposition to scale off. While the filling is being made, each portion of the gold will retain its place, and will neither curl up nor draw away from the walls, whether the edges or center be kept the highest.

Under-cuts may be packed as thoroughly as any other portion, and any cavity that a point can be made to reach can be filled perfectly without regard to the direction it presents, or its location, providing it is kept dry during the operation. Contour fillings can be made which will endure all the force of mastication, and cutting edges of incisors can be put on that will withstand all that can be demanded of the best mallet fillings, and may be made quite as rapidly.

Trials and experiments extending over nearly two years, and constant practice for the past nine months, have convinced me that serrations are worse than useless, and any considerable amount of force is a decided disadvantage.

Any one who will lay together two pieces of freshly annealed gold foil, and bring them into full and close contact by any power, however slight, will be convinced by the perfect union that there is sufficient strength in cohesion to make a reliable filling.

The method here described is an attempt to practically answer the question, How can the gold be introduced and consolidated in the cavity without destroying this quality?

This method differs radically from all others of which I have known, in two respects: First, the glass-hard temper of the smooth points. Second, the manner of applying the force; the steady pressure, with only a slight turn of the point; thus avoiding all pounding or rubbing of the gold.

To prevent extending this article to too great length, I have avoided all discussion of various questions involved, and confine myself to the simple description of the practical working of the method.

DENTISTRY IN RIO DE JANEIRO.

BY J. W. COACHMAN, RIO DE JANEIRO, BRAZIL.

(Read before the Alabama Dental Association.)

It is with no small degree of pride and pleasure that I think of the progress which dentistry has made during the past five years in Rio. I have watched every step with eagerness, remembering well the time when it was with the greatest difficulty patients could be persuaded that an aching tooth was not necessarily lost, or that there was anything better than the most inferior quality of unwashed amalgam with which to fill cavities of decay.

Owing to the manner in which the people had been educated, the dentist was not often asked for an opinion, and less frequently would any attention be paid to it. "Doctor, this tooth aches: take it out;" or, "Put something in it to kill the nerve," was the usual direction. Almost without an exception, it was the rule to apply arsenic to every decay that was to be filled. Even in old, dead teeth, whose roots were enveloped in the sac of an alveolar abscess, when it failed to relieve, extraction was considered the next resort.

We are under many obligations to Drs. Bordell and Van Tuyl, two pioneers who settled in our city long years ago. They did much toward teaching the inhabitants to appreciate correct practice. Much of their work, although done after an old style of practice, remains today, and in all probability will last as long as the present generation. When you see in any mouth here the work of a skillful operator, you will nearly always find, upon inquiry, that it was done by one or the other of these gentlemen. Their names will always be remembered with kindness by many of our citizens.

As yet we boast no dental college. Applicants to practice the profession are examined in Portuguese or French by a board appointed from the medical faculty, which is authorized, in case he is accepted, to honor him with a document announcing to all whom it may concern that he has been found competent, and has permission to practice dentistry in any part of the empire. Not much regard is paid to any foreign diploma. Recently there has been established a dental association, the meetings of which are held weekly. There are connected with it the finest operators of South America.

The American journals are read by some with interest. All are learning to look to the United States for light, as it is universally acknowledged that the profession there is in the advance.

On arriving in Rio, I found it a difficult matter to procure a book of good gold foil in the city; now the market is supplied with foil of English and American manufacture. We are learning the difference between soft and adhesive foil, and some attempts are made at contour fillings, which reflect much credit on the patience and skill of the operators.

The people as a class suffer more from decayed teeth than even you of North America. The principal reasons are perhaps a want of proper diet for mother and babe, a lack of care after the teeth have been erupted, the quantity of acids which are to be found in many of the fruits, and a want of a sufficient number of skillful operators to repair damages when once commenced. Mechanical dentistry is considered the highest branch of the science. There is still too great an inclination to sacrifice the natural teeth for substitutes. For a long time the profession shared the work and divided honors with the barber, thus perpetuating the character of the ancient leech. Even now the barbers extract more teeth than the dentists. It is related of one, that he went round on horseback with his forceps tied to the horn of his saddle, and without dismounting would serve the many who came to him from all corners of the streets. This, however, is a thing of the past. We look forward with confidence to the time when, of the profession in Rio, it may be said with all truthfulness, its members have no superiors.

THE PUBLISHED TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION FOR 1872.

BY H. L. SAGE, BRIDGEPORT, CONN.

THE neat and tasty appearance, generally, of the latest published Transactions of the American Dental Association is, doubtless, appreciated by all who have received them. Most, perhaps, will feel like according thanks to the Publication Committee, for the faithful manner in which they have performed their duties,—duties onerous, and requiring much time and mental labor for their fulfillment.

With these considerations in view, it is in no spirit of unkindness or "*carping criticism*," that attention is here called to the typographical errors which mar the character of the work, and seriously impair the meaning of some portions, thereby proving a source of annoyance and vexation to some, at least, of the authors of the papers therein appearing. To illustrate, the report on Dental Therapeutics contains a number of grave errors, which the writer is positive did not appear in the MS., and which it seems but simple justice and a matter of self-defense to correct. Among the more prominent, may be mentioned the following:

For "18½," on page 73, read "1872"; for "if the sensitiveness might be due," on page 74, read "if the sensitiveness be due"; for "maganese," on page 79, read "manganese"; for "cymglic," on page 83, read "cymylic"; for "Ajonan," on page 84, read "Ajowan"; for "living membrane," on page 85, read "lining membrane"; for "Thymilic," read "Thymylic"; for "chloride of lime," on page 86, read "chloride of zinc"; for "ulcerised," read "necrosed"; for "instead," read "intact"; for "organic," on page 87, read "*in*organic."

The latter mistake might have occurred in the MS., but the others did not. While some of these are comparatively unimportant, in the case of others the reverse is true. All this may be prevented in the future, either by the exercise of more care on the part of the Publication Committee, or by permitting the author of a paper to correct the *proof*, as was requested in the case to which reference is here more particularly made. In this connection, I wish to correct one or two statements which appeared in the report published in the October number of the DENTAL COSMOS, of the Transactions of the American Dental Association for 1872.

On page 537 we read: "Dr. Truman said that the report had taken the ground that alkalies are more injurious to the teeth than acids." The *report did not* take such ground. Also on page 538 Dr. Truman is reported as saying: "In regard to the use of acids for cleaning teeth, favored in the report, he thought it belonged to the dark ages of dentistry." As the report did not favor the use of acids for cleaning teeth, it will only be necessary to call attention to the published Transactions of the Association in proof of my assertion. In fact, that portion of the report was intended as a *dis*approval of the practice instead of an approval.

PROCEEDINGS OF DENTAL SOCIETIES.

ALABAMA DENTAL ASSOCIATION.

THE Alabama Dental Association met in Montgomery, Alabama, August 21st, 1872, the President, J. W. Keyes, in the chair.

Dr. Keyes delivered an opening address appropriate to the occasion.

Dr. Wheeler read a paper upon the "Separation of the Teeth." He does not approve of the use of the file to the extent advocated by Dr. Arthur, but thinks a modification of his views the best practice. He is opposed to wedging the teeth for the purpose of filling, and files so that the teeth will not again come in contact.

Dr. McAuley thinks filing, as recommended by Dr. Arthur, injurious, except where decay exists. He has seen teeth permanently injured by injudicious separation.

Drs. Rambo and Deason approve of the practice recommended by Dr. Wheeler.

Dr. Keyes read a paper on the "Preservation and Development of the Teeth of Children." He regards the use of unbolted flour, and food containing phosphates, necessary to the development of perfect teeth. The toothbrush and toothpick should be freely used. He advises the use of tooth-soap.

Drs. McAuley and Wheeler do not approve of the use of tooth-soap, on account of the discoloration it produces.

Dr. Reese does not think that a properly prepared tooth-soap will produce discoloration.

A discussion was held as to the action of creasote and the essential oils upon the pulp.

Dr. Rambo desired the experience of the members in the use of oxychloride of zinc in capping exposed pulps.

Dr. Locke's experience in its use was unfavorable.

Dr. Coachman caps with oxychloride of zinc, and fills permanently as soon as it becomes hardened. He avoids pressure on the pulp by using a very thin paste next to it. He is not aware of a failure for the past three years, except those occurring before the patient left the office, and these were few.

Dr. Wheeler approves of destroying the nerve and filling the roots, as the most certain and speedy remedy for exposed pulps.

Dr. McAuley does not destroy the pulp. He caps first with celluloid base dissolved in alcohol, and then fills the tooth with os-artificiel, and as soon as it is sufficiently hardened fills permanently with gold or amalgam, cutting away enough of the os-artificiel so that the metal filling can be retained with certainty. Where the tooth has given pain he always punctures the pulp, and thinks this a sure preventive of any after-trouble.

Dr. Deason does not favor the capping of pulps with os-artificiel.

Dr. Evans uses sheet lead for capping.

Dr. Ball has been successful in capping with oxychloride of zinc.

Dr. Stephens does not approve of capping with oxychloride of zinc.

Dr. Reese has been successful with oxychloride of zinc, except where the tooth has given pain or the dentine is inflamed. He fills permanently as soon as the oxychloride is sufficiently hard.

The following were elected officers for the ensuing year:

President —Dr. Wm. Deason, Mobile.

1*st Vice-President.*—Dr. E. G. Wheeler, Mobile.

2*d Vice-President.*—Dr. E. H. Locke, Troy.

Secretary and Treasurer.—Dr. Wm. J. Reese, Montgomery.

Delegate to Southern Dental Association.—Dr. J. G. McAuley, Selma.

Alternate.—Dr. E. G. Wheeler.

Delegate to American Dental Association.—Dr. J. W. Keyes, Montgomery.

Alternate.—Dr. W. J. Reese, Montgomery.

Montgomery was selected as the next place of meeting.

Adjourned.

W. J. Reese, *Secretary.*

EDITORIAL.

THE RELATIONS OF DIATHESES AND CACHEXIÆ TO DENTISTRY.

That the varieties in the physical characteristics of the teeth exhibit a significant relation with the constitutional organization, there can be no question, nor that systemic conditions express themselves with marked emphasis in the character and progress of decay in these organs. There seems to be, however, a confusion of thought, or a careless use of words, in much that is written in which these facts are alluded to; the terms diathesis and cachexia being used interchangeably, though one expresses organization and tendency, the other condition.

Without specification of the associate signs of the highest type of organization, we assume that teeth, regular in their alignment, of large size, rich yellow or yellowish-brown color, the dentine dense, the enamel thickly and evenly deposited, may represent a vigorous, healthy constitution; while those irregular in their alignment, small, stumpy, and incongruous,—individually and relatively,—opaque, and chalky, with enamel deficient in quality and quantity, and irregularly deposited, may represent constitutional poverty. The one exhibits ability to resist local and systemic morbific influences, and to repair damages, in keeping with the vital power inherent in such organizations; while in the other class they are in keeping with the defective structures with which they are associated, have feeble resistance, and inability of repair.

Modifications of these characteristics, of every possible variety in physical outline, in elementary constitution, in size, color, density, crystallization, and alignment, show the relative wealth or poverty of the organization; show, not unfrequently, the influence of the blending of the characteristics of the parents, either the individual teeth exhibiting incongruous associations of structure, or a portion of the dentine indicating the organization of one parent, the remaining portion exhibiting the peculiar diathesis of the other.

We may not, therefore, expect natural formations, natural proportions and symmetry of the teeth, nor resisting and reparative power, except in association with vigorous, healthy organization in one or both parents; in other words, with constitutional equilibrium, perfect balance of the various functions, harmony in the processes of nutrition and waste. Where these are unequally proportioned in one or both parents, the inharmony may express itself in the offspring in what is denominated a diathesis. This hereditary predisposition is distinctly indicated in the dental structures and parts topographically associated. That in the same mouth some teeth are more susceptible to decay than the rest, shows constitutional conditions at the time of their formation, resulting in different degrees of perfection in their texture, and consequently of capability of resisting the action of destructive agents. In any abnormal condition of the general system, it must follow that the nutrition of the teeth and adjacent structures is sure to be deficient to a greater or less extent; inimical constitutional influences affecting these organs as much, and sometimes more, than they do the other tissues of the body.

The deciduous teeth show, in their different constitutional characteristics, the varying health of the mother during their development, and the permanent teeth exhibit the disturbances of the functions of organic life during their formative stage.

Diathesis may, under favorable conditions, be held in abeyance for years—possibly for a lifetime; but when, from some perturbative influence,—insufficiency in quantity or quality of food, the breathing of impure air, continued deprivation of sleep or of sunshine, mental or physical labor in excess, anxiety, grief, or other depressing emotions, exposure to malarial, syphilitic, or other blood poisons, or perhaps from some insensible and unexplainable cause,—there is an interference with the harmony of molecular changes, an inequality in the operation of the processes of demand and supply, functional inharmonies are promptly manifested, and followed by structural changes. There are two periods at which hereditary taints are especially liable to manifest themselves,—puberty and the climacteric.

The causes which are inherent in the individual at birth, the peculiar impress or tendency of which being recognized, we designate by various names indicative of the predisposition thus established, are, by this disturbance of equilibrium,—failure in the co-ordinating force,—allowed to express themselves, and we have a cachexia corresponding to the diathesis.

It may be remarked, parenthetically, that deteriorative systemic influences, thus manifesting themselves in the teeth, demonstrate life and molecular transformations, and should therefore be an incentive to combative systemic treatment, notwithstanding their relatively low degree of vitality.

Whatever the peculiar local manifestations which belong to the different cachexiæ, the systemic disturbances may not be so easily differentiated. In all there is more or less marked inharmony of innervation, impaired digestion, mal-assimilation of food, impoverished blood, failure in the nutrition of the tissues, abnormal secretions, deficiency or excess of excretions, effusions, general anæmia, hyperæmia, depression, and debility.

Dependent upon these constitutional aberrations are the various local expressions, which often, more than the systemic demoralization, distinguish and classify them,—irritation, inflammation, ulceration, suppuration, atrophy, hypertrophy, degeneration of structure, caries, necrosis, and gangrene.

The character of the disintegration to which the teeth are liable differs in the various diatheses,—dark, dry, horny, white, moist, soft, chalky, or cartilaginous, showing the quality of the original structure; a dentine dense as ivory, and an enamel like glass, a crystallization which may be aptly likened to vitrifaction; or a dentine soft or friable, with a semi-crystallized covering, interspersed with chalky nodules or cartilaginous deposits.

The recognition of these varieties in the original formation, and the consequent liabilities and probabilities, must necessarily influence the intelligent practitioner as to the character of the operations he is willing to recommend or perform.

A man is "a man for a' that," says the poet, and, in one sense, a tooth is a tooth for a' that; but so unlike may they be, that what would be good practice in one mouth would be unjustifiable in another. The folly of stated formulas, prescribed manipulations, and an unvarying routine for every operation of each class or variety, is manifest, in view of these facts.

The character of the decay to which the different varieties of teeth are liable, by virtue of their original structure, is an element which should always enter into the calculation when the methods of treatment are discussed. Whether to fill, or to file, with what, and how much, should be determined chiefly on the preceding premises.

No one will venture to affirm that, in the varieties of structure and decay, the same treatment will answer, or that the same results may be expected. Take, for example, teeth showing the original secretion, organization, calcification, and crystallization to have been normal—and the result, a homogeneity of structure—and compare them with those in which abnormal conditions and processes have resulted in a heterogeneous mixture of animal and inorganic materials. Must these be treated in the same manner? and must the practitioner be held to like accountability in operations upon the one class as upon the other? Evidently not. But, until the influence of diathesis and cachexia are better comprehended by the community, unjust prejudices and conclusions will prevail.

"Dr. A. filled my teeth ten years ago, and I have never had to have any work done in my mouth since." "Dr. B.," is the response, "filled my teeth last spring, charging me a round sum too, and they are decaying faster than ever."

These are the facts; but how unjust the inference! Dr. B. is to blame, however, in not recognizing, or in failing to inform his patient of, the facts in his case.

The moral is one which applies to practitioner and patient alike.

THE UNITED STATES CENTENNIAL COMMISSION.

By enactment of the Congress of the United States, the one hundredth anniversary of American Independence is to be celebrated by an International Exhibition of the Arts, Manufactures, and Products of the Soil and Mine, to be held in Philadelphia, in 1876.

To secure the proper organization and conduct of the exhibition, a Commission has been appointed, which has entered actively upon its duties. A Board of Finance, auxiliary to the Commission, has also been created by act of the National Legislature.

Under the authority of this Board, sub-committees have been organized, with the view of systematizing the labor necessary to interest all classes and sections in this magnificent enterprise.

In accordance with this object, a Committee has been appointed, with the special duty of enlisting the dental profession and the manufacturers and dealers in dental materials.

The Committee consists of the following-named gentlemen:

Dr. Samuel S. White, *Chairman.*

Dr. C. N. Peirce,
" David Roberts,
" J. P. Wyman,
" T. C. Stellwagen,
Dr. Geo. T. Barker,
" J. W. White,
W. R. Abbey, Esq.

Any one of this Committee will be glad to receive subscriptions to the capital stock, and to procure and return a subscription certificate for the same.

It is hoped that the profession and trade will manifest their interest by contributing their share to the expenses of so grand an undertaking. The object commends itself in every aspect to the sympathy and support of every citizen of the Republic.

The opportunity is now afforded to all to become owners of the stock, and to share in the management in proportion to the amount subscribed.

The capital stock is $10,000,000. Shares $10 each.

The following is the official statement of the subject:

"The holder of a subscription certificate is entitled to one vote upon each share it represents. Payments on the stock may be made in full, or twenty per cent. on subscription; the balance in twenty per cent. installments when notified.

"Each subscriber will receive, after the organization of the Board, a large engraved certificate of stock executed in the Treasury Department of the United States, in the best style of the engraver's art, bearing designs illustrating our national progress, and commemorative of the Centennial Exhibition.

"It is hoped that there will be no pecuniary loss to any subscriber; but should there be, the certificate will in value go far towards compensating for any such loss, not only as a beautiful work of art, but as an heir-loom to be handed down from generation to generation, doing perpetual honor to the patriotism of the subscriber. The names of the subscribers will also appear in the printed records of this great national celebration.

"By an early subscription you will be identified with the grand industrial monument which the willing and patriotic hands of American citizens will rear to testify their veneration for their self-sacrificing ancestors, and to mark the progress made in a century under the operations of a free government."

PERISCOPE.

THE STATUS OF DENTISTRY IN AMERICA.— * * * Change, however, is to-day the status of the profession in America. Constant and familiar intercourse with members of the professions of medicine, law, and theology, has compelled a comparison of our own with the educational acquirements of others; and while we recognize how much—how very much—has been accomplished in the last few decades, we are painfully impressed with a conviction of how much remains undone. Our communities have ever been responsive in granting every demand in the way of honors—even, indeed, to a degree which failed to distinguish between the titled and untitled; but we fear the profession has not kept always in advance of its reputation. Doctors we have claimed to be,—doctors on our own showing we are; and, taking us at our word, the public expect doctors' acquirements and doctors' duties of us.

To retrograde or to go forward is, therefore, to-day compulsory with the American dentist. The intelligence within and the intelligence without alike demand this. Common, rather let us say distinguished, school privileges are so universally diffused among American communities, that the dentist is compelled to perceive that his claim to belong to a learned profession necessitates a broader culture than has heretofore been deemed sufficient. However excellent as an artisan, he recognizes that the title of surgeon-dentist is not attested by the ability to perform that which the title indicates.

But, as we have said, change is the *status* with us to-day, and we doubt not that in a comparatively few years the American dental surgeon will be as famous, as proficient, and as useful in an enlarged sphere, as he now is, and long has been, as artist and mechanic.

A common profession, a common education, a common degree, and hence common privileges and common honors, with the general surgeon, are now the ambition of our leading men. The manner of the change, which is seen to be inevitable, is therefore occupying largely the thought of the profession. * * * —*American Correspondence of Monthly Review of Dental Surgery.*

AMERICAN ACADEMY OF DENTAL SCIENCE.—The fifth annual meeting of the American Academy of Dental Science was held in Union Hall, 800 Washington Street, Boston. Prof. P. H. Austen, M.D., D.D.S., of the Baltimore College of Dental Surgery, who was to have delivered the annual address, sent a letter instead, in which he stated that the state of his health was such that it would be impossible for him to attend. He thus continued: "Permit me, before closing this letter of apology, to express my pleasure at the dignified position and bearing of your society. Also, let me accord my warmest approval of the educational movement in which some of you are engaged. In my unfinished address I have sought to show that the term liberal, as applied to any profession, should not be allowed to lose its classical meaning,—that all professional schools should be so planned that their diplomas would necessarily imply familiarity with those liberal sciences which it is too much the custom of this practical age to regard as useless incumbrances of a gentleman's education. By bringing dental teaching within its university curriculum, Harvard designs, I take it, emphatically to indicate this specialty of medicine as one of the important practical applications of the power of educated mind. When a man is master of the arts of study and thinking, he is prepared, as he can in no other way be, to master the technical difficulties of his future profession. Hence, for one, I shall heartily rejoice when there exists neither medical nor dental schools, except in such connection with our literary colleges that a diploma from one implies graduation in the other. In no other way do I think we can stem the inundation of titled ignorance, which seems to be fast sweeping from the professions all trace of what once made them liberal."—*Am. Jour. of Dental Science.*

ABNORMAL SECRETION.—Dental caries we believe to be on the *increase*,—is now well-nigh universal,—while recession of supporting tissue by mechanical irritation and other causes is fearfully prevalent, even with the young.

What is the cause of this destruction, and the remedy what, are questions as pertinent now, perhaps, as at any time previous.

"Sins do not spring out of the ground," neither is caries from within, else the more we excavate the worse would we make it. The recuperative power is so low that the teeth *submit* to the process of filling; hence also the unheard-of phenomenon of a carious tooth restoring itself.

But we *submit* that our present treatment is too topical.

In health of the moisture of the mouth, that secreted by the parotid glands—conglomerate—is a clear, limpid fluid, slightly alkaline. That from the submaxillary and sublingual—also conglomerate—is slightly alkaline, but is viscid or ropy. The follicular secretion, or the moisture of the mucous membrane at or near the fauces, abounds in this viscous albuminous material, and at the margins of the gums is, we believe, a little acidulate, since litmus is reddened at these points more commonly than we find it elsewhere, after making due allowance for any foreign deposit.

If this be correct, the equipollence of these two directly opposite substances, in health of the oral cavity, is beautiful, each in turn rushing to the rescue of the teeth as the enemy of the one or the other enters the chemical laboratory.

In health of these well-springs, and when no suggestive touch, odor, or mental impression is made, the whole seems neutral, and not very destructive to food; and unless there be some defect in the formation of enamel at depressions, teeth, even those wanting in the best proportion of phosphates and animal material, are not liable to extensive decay in this condition.

But extensive destruction is the *rule*,—the reverse is the exception, and the destroyer of teeth is from without.

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Notwithstanding these glaring possibilities, the fact must still remain that abnormal secretion is constitutional as a general proposition, and must ultimately be treated as such.

That the secretions of the mouth are generally abnormal is, we think, the conviction of most persons called to dispute the progress of dental caries. Ostensibly these destructive agents are either an excess of acid—the commonly accepted opinion—or of alkali.

At first it is odd to suppose that alkali, an object so near akin in substance to dentine, two-thirds of which is phosphate and carbonate; but remembering that its animal portion is protein (most albumen, fibrin, and casein), and that alkali forms with it soluble compounds, it seems to us that the conclusion, that under such condition the dissolution of dentine is inevitable, is just as logical as that acid neutralizes alkali, which itself, by the way, must be taken with some degree of allowance.

The prevalence of large deposits of salivary calculus, and the fact that once deposited in a tooth it effectually arrests decay, while the inference is strong that alkali in the secretion is largely in excess, might lead to the erroneous conclusion that if alkali would destroy teeth at all it would be in such instances.

But tartar is not exclusively calcareous: it is a concretion of broken down epithelium, fibrin, and quite a variety of precipitates, including phosphates. Acids will not always dissolve it, though sometimes this is due to the fat it contains.

Tartar is more a residuum of some chemical union rather than a cause of itself. Let us not deceive ourselves by giving alkali a less prominent place in this destructive process than it deserves. Its action is more remote in inception, but not consequently less effective.—*Dr. O. Willson, in Am. Jour. of Dental Science.*

DEGENERACY OF THE TEETH—Mr. Alfred Coleman, dental surgeon to the hospital, contributes a paper to these reports upon the degeneracy of the teeth, and endeavors to account for the assumed fact that the teeth of the present are more subject to disease than those of the past generation. The author inclines to the general belief that this degeneracy is due to the teeth of the present time being really inferior in strength and durability to those of past generations, and not to their being only apparently more diseased from greater attention being directed to this subject. In support of these views the author referred to a paper entitled, "Remarks upon the Collection of Skulls in the Crypt of Hythe Church, Kent," Odont. Trans., vol. iv.

The present degeneracy was shown, also, in defective development, in the frequent absence of certain teeth and their premature loss, from absorption of their alveoli. The many causes which combine to produce the present degeneracy may be summed up in the words, condition of modern civilization. The crowded condition of the teeth which exists in the civilized rather than the uncivilized communities favors disease. According to Darwin, our notions of beauty, which favor the propagation of a form of feature unfavorable to prominent teeth and well-developed arches, is the great cause of this Another great cause for the present want of development is to be attributed to imperfect employment,—our food, as now prepared, does not make such a call upon the strength and good development of the teeth. Organs or structures not properly called into use do, we all know, undergo some forms of degeneration, and it is only fair to conclude that the teeth follow the same law. Moreover, the teeth, as they become worn, become harder in texture.

Again, by the employment of soft food the gums degenerate, losing a stimulus for healthy circulation, and the teeth which require a certain antagonistic pressure to retain them in the jaws, suffer through a continued use of soft food.

To these two causes, crowding and disease, the author adds another reason for degeneracy, viz., the greater strain which now exists upon the nervous system ; and although all these unfavorable conditions have been accumulating for centuries, the change in our habits has been greater in the last fifty years than in the previous two centuries, so that, should this degeneracy continue, Mr. Darwin predicts that man will eventually become an edentulous being. Such being the prospect, what remedy can be suggested ?

For the correction of overcrowding, the author advises the timely removal of decayed teeth, or failing these, the four first permanent molars. As to food, the author recommends the use of bread made of whole meal flour, the avoidance of sweet things in excess, or vegetable acids in quantity. In taking a valuable tonic, such as tinct. ferri perchloridi, the use of a tube is of little use, but the mouth should be rinsed afterwards with a strong solution of potassæ or sodæ bicarb. As to meat. the author strongly advises that children should be allowed a free use of bones on which to exercise their teeth and gums, and that the use of the brush should be taught with the first appearance of the teeth. Tooth powders, unnecessary when the teeth are carefully and thoroughly brushed, are required when they have been neglected. In conclusion, we would say this is a most excellent and *practical* paper, and by no means requires the apology the author makes for its introduction among the more scientific and labored papers in the "Reports of St. Bartholomew's Hospital."—*British Journal of Dental Science.*

THE USE OF THE MAGNIFYING-GLASS IN DENTAL OPERATIONS.—By a magnifying-glass used in operations on the teeth is meant, not the small reflecting mouth mirror common among dentists for examining the teeth, but a large lens about two or three inches in diameter, mounted in a frame with handle, such as is sometimes used for looking at engravings and pictures. Many a gold stopping, which looks very solid and perfect to the naked eye, will be found exceedingly defective in many places when tested under view of this instrument.

Small projecting pieces of gold, pits, fissures, and cracks will discover themselves where food and acid can lodge, and soon work destruction along the sides of those brightly shining jewels, which young, enthusiastic dentists assure their confiding patients will look just as well in twenty years' time as now. One, two, or three years make a wonderful change in most of them; there is no greater cause of failure in central cavities of molar teeth than minute fissures which are overlooked, not exterminated, and not stopped. By the use of the magnifying-glass, the insidious nature of these dangerous lines is seen at once; should the gold suddenly cease at the entrance or middle of one of them, all the labor will be thrown away, that side of the plug is sure to fail before long; the line widens, the brown or white decay steals its way underneath the metal, and a hard bite sends it in with a crash. The magnifying-glass will be found exceedingly useful in the examination of cavities that have been cut out and prepared for stopping. It brings to view rough edges, particles of decay, chips in the enamel, etc., which should be attended to before the metal is introduced.

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A careful, painstaking dentist will make a tooth last far longer with the very worst material, and in many cases none at all, than an inferior workman will do with the very best; no matter what the plug is formed of, unless great and almost infinite care be taken in the preparation of the cavity, cutting away all weak points, exterminating fissures, smoothing edges, etc., in a very few years the enemy gets within the fortress, and all is lost.

After much experience, with opportunities of seeing the very best of work, my belief is that hitherto few, very few, stoppings, notwithstanding all the pains that have been taken, ever see ten years or over, and the majority not three. This is owing very much to the careless examination of the teeth before inserting the plug, and the same after all is finished.

It should never be forgotten that we have to contend against an enemy which can penetrate the most minute crack, point, or fissure, where he can remain without disturbance, and slowly but surely work his mischief. Mr. Fletcher's white stopping will no doubt increase the number of rescued teeth by putting a good material in place of bad ones; but those who imagine they can very much abbreviate the time required for success, or get through these operations in a rapid and off-hand manner, will most likely reap disappointment to themselves and those who trust in their skill.

In stopping teeth, nothing should be hurried, nothing slovenly allowed; there is no royal road to success here any more than anywhere else; a satisfactory result can be looked for from nothing but painstaking and hard work, and, with all these combined, the result will often be anything but what is looked for. I have seen gold stoppings done by one of the best and most skillful of dentists break down and entirely fail in less than two years.

I would particularly warn young men against a very common fault, that of exultingly exclaiming, at the end of what looks a very perfect operation, "That tooth will last your lifetime." How often these hopes are shattered to pieces in a year or two, especially with children, every experienced man soon finds out; exulting dentists will find they have to eat an amazing quantity of humble pie before they die. As a case in point, I may mention that six cavities on the labial surface of the front teeth of a patient, aged sixty, were stopped with gold about twelve months ago; very great pains were taken with them; the plugs look firm, bright, and polished, but, on examination with a magnifying-glass, a well-defined line of abrasion or white decay runs round every one of them. I suspect that galvanic action has something to do with it, and there is every probability that not one will stand. In another case, exactly similar as far as age, temperament, and quality of tooth-structure goes, the front incisors were stopped with Jacob's filling, the patient objecting to gold, and after six or seven years are perfectly good and sound, the only disadvantage being a slight yellow deposit on the stopping. In this case there could be no galvanic action. *Pro bono publico,* I intend to take out one stopping from each mouth and replace them with Fletcher's enamel, as an opportunity of occasional examination can most likely be taken advantage of. I hope this stopping may have the good qualities claimed for it, but it will require many years to establish its reputation.—*J. H. Parsons, Esq., in British Journal of Dental Science.*

Pivot Teeth.—Many and ingenious methods have been resorted to, to make efficient what seems, under some circumstances, so desirable, viz., pivot teeth. In but few instances, however, and then only under the most favorable circumstances, with the nicest manipulation, have they been successful, since the point of contact of root and crown is never a union close enough to prevent its being a mere starting-point for softening or decay. As a remedy for that evil I beg leave to offer the following to my professional brethren with the hope of its usefulness.

Instead of adapting a crown with a fixed pin, of either wood or metal, to a root, insert a metal pin in the root; make a filling of gold on the end of the root, and adapt your crown to that. You will only expose what appears a small filling along the margin of the gum. Our own method is to insert an eighteen karat pin (platinum alloy) firmly into the root by means of threads cut on that part of the wire to be inserted, having the other end cleft with a watch-spring saw, and protruding sufficiently to occupy the hole in the crown; we now adjust the crown, which, however, should have been measurably investigated before the wire was inserted, by means of a stick loosely inserted in crown and root. The wire having been finally screwed into the root, and a proper crown selected and adjusted (of course the end of the root should have been filed and polished, but the filling should not be carried into the gum, unless compelled to do so in removing decay), remove the crown, and enter two or three of Dr. Mack's short retaining-screws Now cut a number of pieces from the heaviest gold—say No. 480—a little longer than the end of the root, with holes punched to correspond with or pass over the pins in the root; lay on one after another, condensing with a smooth-faced instrument, occasionally paying particular attention to condensing small pieces around the pins. The concavity usually given the root (though it should not be so great) should be maintained on the surface of the filling; which, having been raised above the heads of the pins or retaining screws, and of a thickness equaling a plate 16 or 18 by the gauge, may be polished and burnished. Then grind and adjust the crown, file down and polish the protruding marginal gold to a line with the root and crown. A rubber dam should be used, as it will be almost impossible to make the proper filling otherwise. If the spring of the cleft end be not sufficient to hold the tooth firmly, a fragment of wood in the wire large enough to make the crown go on by smart pressure will answer. Os-artificiel or Guillois's cement may be placed in the crown, and held in place until it sets.

If the root has been previously pivoted, and is therefore more or less funnel-shaped, the filling will be successfully retained by the threads on the pivot and the irregularity of the prepared walls. If this method is carefully and rationally executed by one who can make a good filling with heavy gold, we cannot see in what material sense it will differ from any tooth which has had its nerve destroyed and afterwards filled with gold. In all of the other methods decay will go on. Dr. Mack's method comes nearest to success, but fails on account of the destructible nature of the material used in uniting the crown to the root. If such a necessity should arise, it is perfectly practicable to remove the crown and screw out the pin, as it is also to insert it in the first instance with a fine hole the size of the smallest canal plugger drilled through the entire length, for the discharge from the root, to answer the place of the groove formerly cut along the wooden pivots. However, this latter part is unnecessary, as a root should be restored to a healthy condition before it is pivoted.—*E. L. Hunter, D.D.S., in Am. Jour. of Dental Science.*

NEW TREATMENT OF EXPOSED PULP.—Mr. Coles exhibited a small bottle of pepsin porci; had for some time past used it with great benefit for the destruction of the dental pulp; it caused no inconvenience to the patient.

In reply to Mr. Coleman, he said he mixed the pepsin with dilute hydrochloric acid (two per cent.), and applied it in the usual way, leaving it in the cavity three days, though it might be left in for a week with perfect safety.

Mr. Harding asked if Mr. Coles had ever found any ill effects from leaving arsenious acid in a cavity,—he had not.

Mr. Coles said he had, and mentioned the case of a lady in which it had caused necrosis.

Mr. Fairbank asked how long it took to cause the destruction of the pulp.

Mr. Coles did not agree with entirely destroying the pulp; supposing some of it to be healthy, preferred to destroy the diseased part, and then cap the remainder, the pepsin acting upon the diseased pulp only, leaving the healthy intact.

The president had great objection to the use of arsenious acid; thought it advisable when there was great pain to remove it in six hours, and would never allow it to remain more than twenty-four hours, believing that the periosteum would then be endangered.

Mr. Coles said he had never had bad results from the use of pepsin.

Mr. Sewell thought that Mr. Coles's communication with regard to the pepsin was one of the most useful that had been made to the society for some time; he considered there was great danger in the use of arsenious acid.

Mr. S. C. White asked Mr. Coles how soon after the application of the pepsin he permanently filled the tooth.

Mr. Coles said that the great peculiarity of the pepsin was that it attacked and destroyed the diseased pulp, leaving the healthy intact; after its application he syringed out the cavity, and then temporarily filled it, and did not put in the permanent filling for perhaps six months.

Mr. Coleman was glad of the explanation given by Mr. Coles, that it was not an agent for the destruction of the pulp, but for the removal of the unhealthy tissue.

Mr. Fairbank thought that the decomposed animal matter acted in the same manner as pepsin; it therefore seemed peculiar that pepsin should act as a destructive agent to the decomposed pulp.

Mr. Coles said if such were the case, there would be no necessity for any agent; for as the pulp became diseased it would dissolve itself away. —*Proceedings Odont. Society of Great Britain, in British Journal of Dental Science.*

On the Destruction of Oxychloride of Zinc Fillings.—It has been frequently observed that these invariably fail first in those parts in contact with or near the edge of the gum, without any explanation having ever been offered as to this unpleasant peculiarity. A series of experiments has proved conclusively that the resistance to solvents of the tooth substance in this part is very considerably greater than that of any part of the crown, the grinding surface being very much the most soluble in acids. This proves that a greater amount of insolubility is necessary in fillings in this position, and that a filling which will stand on a grinding surface runs a considerable risk of destruction on approximal surfaces near the free edge of the gum.

Another curious fact may also be noted: the tooth substance becomes very much more insoluble in acids on the first commencement of decay, and if a tooth, having a very small cavity, is dissolved slowly away in acid, the decayed portion will be left as a raised cone, untouched or nearly so by the same solvent which has eaten away the remainder of the tooth.—*O. C., in Monthly Review of Dental Surgery.*

Treatment of Facial Neuralgia.—Of all the ills to which suffering humanity is heir, I don't think there is one which causes more physical anguish while an attack lasts than bad facial neuralgia. In every-day life it is looked upon as a mere nothing, an affection readily giving way to so-called household remedies, and an inconvenience that has to be made the best of, though, of course, painful; but when the physician comes to think of the subject, he looks at it in quite a different light, and recollects how frequently he has been consulted by those who have found household physic anything but effectually remediative. He forgets not the intensity of the pain he has seen endured, the torturing agony, the almost insurmountable difficulty experienced sometimes in alleviating it, and the frequency of its recurrence in those who are more especially wont to be the subjects of it. He often finds it a most formidable foe, and one most difficult to abate. For these reasons my readers may perhaps pardon a very brief consideration of a subject apparently trivial, but, nevertheless, unmistakably important. The essential causes of the affection are so diverse, it becomes self-evident that any one mode of procedure could never be expected to succeed equally well in all cases, which, though apparently similar, widely differ in their respective etiological bearings; it is, therefore, necessary that the different forms of the disease should be clearly discriminated in order to lead us to the correct application of those agents which we determine as reliable. The most common neuralgia is that of the dental nerve fibres alone, arising from the exposure of the pulp of one or more teeth, and consequent radiation of abnormal sensation along the terminal filaments of the same nerve—neuralgic toothache in fact. For this, extraction of the diseased tooth or teeth will generally alone prove effectual towards its relief, although, when practicable, well-adapted stuffing, after destroying the sensibility of the dental filament, very frequently stops the neuralgic pain consequent upon the toothache; warm sedative fomentations and the like give temporary relief. Such cases are of every-day occurrence, and lie more in the province of the dentist than the physician; but there is another class of cases to which so-called neuralgic patients are most liable, some much more so than others, which is the true uncomplicated facial neuralgia. It is that form of general neuralgia caused by exposure to cold, particularly to a draught. The draught of a railway carriage, sitting sideways next a window or between a window and open door, coming out of a warm room to a lower temperature, damp, sudden meteorological or thermal vicissitudes—any such influence may give rise to it. Just as a cold draught with some brings on that unilateral paralysis of the portio-dura, wholly temporary and functional, quite independent of any inter-cranial disease, commonly called the paralysis of Sir Charles Bell, so may it in the case of others give rise to a highly exalted sensibility of the numerous branches of the ganglionic portion of the trigeminal nerve, alike temporary and functional; and as some are more particularly subject to the former, so are others to the latter. This neuralgia is almost always unilateral, certainly most generally so if not always, and, as it is most frequently met with in those who have carious teeth, it must carefully be distinguished from that simple neuralgic pain confined to the branches of the dental nerves, and caused by toothache. That is, when this true form of neuralgia occurs, as, indeed, it most frequently does, in the subjects of carious teeth, although it may be aggravated by that extra irritation along the course of the dental nerve, yet it is not common dental neuralgia, and its *prima facie* origin is otherwise. This neuralgia comes on more suddenly, without premonitory pangs of toothache, and is more diffused, nearly all the divisions of the ganglionic portion of the fifth nerve being more or less involved; more especially the superior maxillary, both at its exit through the infra-orbital foramen, between the muscles which elevate the upper lip and angle of the mouth respectively and along its branches. The various filaments of the superior dental are the seats of extreme torture, and generally the infra-orbital and course of the small temporo-malar filament as well; the Vidian from Meckel's ganglion transmitting the pain along the chorda tympani, tympanic, and petrosal branches of the seventh, with which it anastomoses to the palate and ear. The sensory branches of the inferior maxillary are likewise affected, the filaments of the inferior dental, chiefly along its whole course, and the temporo-auricular, which runs between the internal lateral ligament and inferior maxilla, giving rise to intense pain towards the prominence at the angle of the lower jaw. The frontal branch of the ophthalmic division, which escapes through the supra-orbital foramen, is also the seat of pain, but not by any means so frequently in this form of neuralgia, of which the immediate exciting cause is exposure to chill. This general unilateral neuralgia when the attack once supervenes in the neuralgic subject, produces, I suppose, for the time the most acute pain that can well be experienced, and when at its height the poor sufferer, ready almost to dash his aching head against the wall, having borne the excruciating torture almost past endurance, while he assiduously tries every imaginable household remedy, the suggestions of every friend, sends madly off for medical advice. We presume fomentations and inhalations have all been used (and *en passant* we may observe the great relief obtained by stuffing the ear with a plug of cotton steeped in laudanum, and at the same time rubbing plain laudanum assiduously over the face), but, the pain continuing, the practitioner arrives. It is at this juncture I have found the sulphate of beberia* (the officinal alkaloid of the *Nectandra rodiæi*) an efficacious resource, and I don't think I have ever employed it in this form of neuralgia without success. I prescribe it thus with almost certainty, ordering at the same time a full dose of brandy or whisky in hot water:

℞.—Beberiæ Sulphatis, gr. xxiv;
Morphiæ Hydrochloratis, gr. j. †

Tere bene atque fiat massula ope mucilaginis, in pilulas sex dividenda.

I give one of these every ten minutes for the first two or three doses, afterwards every quarter of an hour or twenty minutes, and find the pain subsiding considerably after three or four have been taken. The six are almost certain to give the much required ease. An anodyne (chloral hydrate in combination with bromide of potassium the best) procures sleep, so essential to the exhausted frame, and calms nervous irritability. Finally, galvanism should be had recourse to for some days, a most valuable therapeutic agent in the neuralgic subject. Failures experienced with the use of sulphate of beberia I alone attribute to its being administered in unsuitable cases—for instance, dental, intermittent, or hysterical neuralgias. Many different remedies are being daily tried. The plain pulvis ferri or carbonate of iron has been recommended me, but I have never found it necessary to adopt it. Intermittent neuralgia is very common too, and, of course, at all times successfully combated by quinine, that inestimable blessing to mankind; but let the dose be large, as large as can consistently be administered, having regard to individual circumstances. Hysterical neuralgia appears to yield with most facility to the valerianates, of which the valerianate of quinine is preferable, possessing as it does both anti-periodic and anti-spasmodic properties. The application of magneto-electricity or galvanism is also advantageous. Tic-douloureux, a name‡ so frequently confounded as to be considered synonymous with all facial neuralgias, really differs essentially, in that true tic-douloureux is localized over one of the three several foramina through which the frontal, superior maxillary, and inferior dental nerves respectively emerge. This is generally described as being identical with facial neuralgia, but is more chronic; a constant, dull, heavy, racking pain, at times acute, and absolutely intolerable, compared by Sir Astley Cooper to "the horrid sensations created by electric shocks." Indeed, the description given by that eminent authority of this fearful affection is graphic in the extreme,—"The pain," he writes, "experienced by those afflicted with tic-douloureux is, I believe, indescribable,—it is of the most acute and distressing kind, —I have seen it cause the tears to trickle down the cheeks of a fine old weather-beaten naval officer,—a man who had fearlessly faced the cannon's mouth." He also speaks of the exhibition of carbonate of iron as having been first suggested by the late Mr. Hutchins, of Nottingham, and appears to think highly of it. Indeed, it seems to be in this form of neuralgia that all constitutional measures are so strongly indicated; hence we may infer its efficacy. Abernethy (who seems to have discussed all neuralgias under the head of tic-douloureux) says: "I am convinced that the treatment of tic-douloureux should be constitutional treatment, and such as is calculated to allay the irritability of the nervous system." Gastric or intestinal irritation seems to give rise to it, as also gout and many other sources of disordered functions. Pressure, I have little doubt, however, in those bad instances of tic with which we occasionally meet, is the true origin; otherwise it should be strange for the pain to be so persistently localized over the spot whence the nerve emerges from the osseous canal. *Post-mortem* examinations appear to have disclosed but little, if any, alteration in the nerve substance, but, as Mr. Erichsen suggests, the osseous canal itself may be the seat of periosteal inflammation, or other disease. In the celebrated case of Dr. Pemberton, a projecting piece of bone was found to be the exciting cause. Sir Henry Halford, indeed, adduces five cases illustrative of such an hypothesis, and considers the disease due to "a preternatural growth of bone," "a deposition of bone," or "a diseased bone." Subcutaneous section of the nerve has long been tried, and occasionally with success. Anæsthetics have been advocated as palliative, and, indeed, sometimes may be required. I have found the local application of ether spray, or a small current of icy-cold water poured from a height, of much benefit in procuring the temporary alleviation. Internally, opium comes better to the rescue than chloral, or any other narcotic sedative,—that time-honored drug, than which none other has ever conferred the like æsthetic benefits on the human race since first the guests of Menelaus drank *nepenthe* at the hands of the Argive Helen; it not only calms the extreme nervous hyper-irritation, but supports the exhausted system generally. In the other form of facial neuralgia I have seen chloral most useful, but then it is subsequent to the abatement of pain by means of the sulphate of beberia; in this case the opium (or other drug, according to the discretion of the practitioner)

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* Its exhibition in neuralgia was first suggested to me by Mr. Spencer, a most intelligent inquirer and successful practitioner, but I subsequently found it was not applicable in every case; hence have tried to show here that class of neuralgia in which it is immediately suitable.

† I have found beberia quite as active without this addition, but the morphia tends to soothe while the alkaloid is acting on the system.

‡ It seems originally the word neuralgia was applied by Chaussier, but was first described by André, and by him denominated tic-douloureux, called "neuralgia faciei" by Good, also "dolor cruciens faciei," "prosopalgia," etc. etc., by different authorities. They all appear to refer to the same affection, and fail to dis-

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criminate any difference between general facial neuralgia and tic-douloureux, which they describe apparently as identical. Indeed, the term "tic-douloureux" is, in general, applied to all facial neuralgias, be their origin as they may.

has to be exhibited during its continuance, when I do not believe an ordinary dose of chloral to be efficient, or an extraordinary one safe. Various hypodermic injections, counter-irritants, liniments, and internal remedies, have each and all their advocates. Of course, any source of irritation that can be treated must be treated as indicated, and removed as far as possible. I have seen strychnine and iron of use, and should have little hesitation in cases of doubtful origin to try a combination of arsenic, strychnine, and iron; say a mixture containing liquor strychniæ, liquor arsenicalis, and tartrate of iron, or pills with arseniate of iron, sulphate of iron, and extract of nux vomica, in combination. The field is wide; judgment, experience, and discretion must dictate. The great question seems to be in every case—Is the neuralgia caused by intercranial, osteal, or periosteal disease, or not? in fact—is its origin organic or functional? The origin, if possible, being once established, everything can be brought into requisition likely to prove beneficial, either directly or contingently. Facial neuralgia may be also caused by the pressure of enchrondromatous, malignant, or other tumours,* pressing on the peripheral extremities of the branches of the trigeminal nerve. Such, of course, unless the pressure be removable by the operative interference of surgery, can alone be temporized with in the hope of alleviating immediate suffering. In conclusion, I may observe that, although by some the subject of facial neuralgia may be deemed insignificant, it thoroughly deserves scientific consideration.—*Dr. F. E. Clarke, in Med. Press and Circular.*

NECROSIS OF THE BODY OF THE SPHENOID BONE: REMOVAL.—G. S., aged forty-three, laborer, residing at the Paddington Infirmary, was admitted under Mr. Erichsen on February 12th, 1872.

History.—Patient a native of Corfu. Has knocked about a great deal. Fifteen years ago, when in Brazil, he appears to have been syphilized. He had a chancre on the glans, and suppurating buboes in both groins. He had an eruption over the chest and abdomen, and before twelve months were up had sore throat. Says he had rheumatism in left leg. He does not know much about his treatment; he thinks he took mercurials. Began to have an offensive discharge from his nose three years since. At the same time the teeth in the upper jaw, on the right side, began to loosen; these were taken out, and some pieces of bone with them. Two years ago some pieces of bone came through the palate. For the last five years he has suffered considerably from headache over the two frontal eminences. With the exception of occasional headache and failure of memory, he has never had any cerebral symptoms.

Present Condition.—Patient looks over sixty; says he is only forty-three. He speaks in a muffled, indistinct manner. Has some difficulty in recalling dates or exact order of occurrences. Over the right malar and malar process of the superior maxilla there are some swelling, redness and tenderness; and over the malar process of the maxilla there is the opening of a sinus, which discharges rather thick pus. There is a little puffiness just below the right eyelid, where the pus burrows somewhat. On passing the probe downwards and a little inwards through the sinus above mentioned, some diseased bone is felt. There is also a slight puffiness in the left malar region. Patient's nose is thickened above, rather collapsed in the lower half, so that there is a sinking in along the lower margin of the nasal bones. On probing upwards, some bare bone can be felt in the right nostril; and on passing it down, the probe passes freely in the direction of the antrum, and also touches some bare bone. There is communication at the upper part between the two nostrils, but at the lower part the septum appears thickened. On opening the mouth, the alveolar border of the right superior maxilla is seen to be deficient, and there is a fissure between the roof and the lip extending from the middle line to about the position of the third right ulnar; also, the bony palate appears to be deficient on the right side, although the roof of the mouth is maintained up to the fissure. Some bare bone can be felt and seen through this fissure. On the left side both alveolar border and palate appear to be tolerably healthy. There is considerable stomatitis. In the middle line, at the junction of the hard and soft palate, there is a perforation. Nothing can be seen of the tonsils. The tip of the uvula is rather congested. At the back of the fauces a lot of whitish cicatricial tissue can be seen. There is the scar of an old chancre on the glans penis. Some hardened lymphatic glands can be felt in both groins.

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* Sir Benjamin Brodie records an instance of severe neuralgia being caused by the pressure of an aneurismal tumor.

Operation (February 14th).—Mr. Erichsen removed through the cleft of the palate two pieces of bone,—one of them about a cubic inch in capacity; the other a small triangular piece, with a base half an inch long. There was no hemorrhage. Cavity stuffed lightly with lint.

Mr. Beck reports: "The pieces of bone were so coated with inspissated pus, etc., that their nature could not be recognized. On carefully washing them, the smaller piece had a smooth surface belonging to some foramen at the base of the skull; it looked most like the foramen ovale, but it could not be certainly ascertained. The larger piece consisted of the whole body of the sphenoid bone and the roots of the pterygoid processes, including the Vidian canal on each side. It had the sella Turcica and the grooves for the carotid arteries well marked. The clinoid processes could not be distinguished. The sphenoidal sinus on the left side was open and natural; on the right side it was partially filled up by a deposit of new bone. The surface of the fragment was everywhere worm-eaten. In the sella Turcica it was perforated in one place."

15th.—Patient does not appear to have suffered much from the operation.

24th.—House-surgeon removed part of malar process of superior maxilla from the small suppurating cavity below the right orbit.

28th.—Discharged.—*University College Hospital Reports, in Med. Times and Gazette.*

ANCHYLOSIS OF THE LOWER JAW.—The patient was twenty-seven years old, and was affected with complete anchylosis of the jaw, the result of an inflammation following scarlet fever. The growth of both upper and lower jaw was appreciably retarded, in consequence of continued disuse. Perfect relief was afforded by an operation, which consisted in removing a wedge-shaped portion of the lower jaw, the base of which pointed downwards. At the time of the report, four months after the operation, the motion of the jaw was completely restored.—*Arch. f. Klin. Chirurgie.*

Excision of Inferior Maxilla.—J. Lizars Lizars, M.D., of Toronto, Canada (*Canada Lancet*, Oct., 1872), describes a case of excision of the inferior maxilla for an enlargement of this bone, extending from about one inch below the zygoma to a line perpendicular from the angle of the mouth, in a man aged thirty-seven years, which was performed as follows: One straight incision was made from the angle of the mouth towards the upper part of the lobe of the ear, as far as the posterior margin of the ascending ramus of the maxilla, the periosteum of the jaw, the masseter, and that part of the temporal muscle attached to the outer and lower part of the coronoid process being denuded by the handle of the scalpel and fingers. The internal maxillary artery was avoided. The proximal end of the facial and inferior dental were the only arteries requiring ligature, a few smaller branches being arrested by torsion. In this case paralysis and salivary fistula were completely prevented.

In speaking of the modes of operation, he inquires which is preferable, a simple scar across the cheek and full power of all the muscles of expression, or a scar which must show more or less a staring eye, a mouth dragged to one side and devoid of play, with probably a constant dribbling of saliva from one corner of it. He most firmly believes that every man or woman of ordinary sense would prefer the former.—*Medical Record.*

Treatment of Fracture of Inferior Maxillary Bone.—Dr. R. W. Murphy, of Sacramento, Cal. (Dr. Logan's Report), has devised a new, practical instrument for the treatment of fracture of the inferior maxillary bone. The practical advantages of this splint are: 1. It is not difficult to apply, and when applied it remains in position. 2. It allows of the free use of the jaw and the taking of nourishment, even meats and solid food; and also the use of tobacco, both chewing and smoking. 3. In comminuted fractures perfect articulation of the teeth is easily secured, which is a point much to be desired, both by the physician and the patient.

The splint presented to the Philadelphia Museum is made of steel, and nickel-plated, to prevent it from corroding in the mouth. The underplate is made of hard rubber; the whole splint may be made of hard rubber, which he thinks would be cheaper and answer every purpose.—*Medical Record.*

Cancrum Oris.—

℞.—Cupri Sulphas, ʒss;
Pulv. Cinchona, ʒi;
Aqua, ℥i. M.

Apply with a camel's-hair brush, three times a day.

I have tried this treatment for twenty years, never having it fail in my hands.—*Georgia Med. Companion.*

A Good Prescription in Facial Neuralgia.—

℞.—Distilled Water, f℥ij;
Valerianic Acid, f℥i;
Subcarbonate of Ammonia, q. s.

To neutralize the acid, add,

Alcoholic Extract of Valerian, ℈ii.

Dose, one teaspoonful three times a day.—*Georgia Med. Companion.*

PILL FOR NEURALGIA.—

℞.—Ext. Hyosciamus,
Ext. Valerian,
White Oxide of Zinc, āā ℨi. M.

Make the mixture into sixty pills. One pill may be taken every three hours. This is a favorite old prescription of the German and French physicians, and is mentioned in many of their works on therapeutics.—*Georgia Med. Companion.*

ANTI-RUST VARNISH FOR IRON AND STEEL.—Take the following ingredients, 1, 2, 3, in a pounded condition, and digest them by a regular heat till melted, then add the turpentine very gradually, stirring all the while: 1. Resin, 120 parts; 2. Sandarac, 180 parts; 3. Gum lac, 50 parts; 4. Essence of turpentine, 120 parts. The mixture should be digested until dissolution; then add—Rectified alcohol, 180 parts. Filter through fine cloth or thick bibulous papers, and preserve in well-stoppered bottles or cases. It will be found very effective in preserving things from rust.—*Journal of Applied Chemistry.*

TO MAINTAIN A CONSTANT STREAM OF AIR WITH BLOW-PIPE.—Take an ordinary brass blow-pipe, and bore a small hole in the side of it; then slip over the hole a piece of fine rubber tubing of the thinnest variety, and tie down the ends with sewing-silk. By using the tip of the tongue as a check-valve while inhaling, the rubber previously expanded by air will, by its elasticity, contract and maintain the stream of air without any pause. I have found this a great relief to muscles of the cheeks in blow-pipe analysis and in making small glass articles in the laboratory. For glass-working, I fasten a common blow-pipe in a wooden retort clamp, so adjusted as to properly direct the flame; then I connect this blow-pipe to a mouth-tube, rigged with a rubber inflator as above, by means of a flexible tube. This leaves both my hands free, and I find the apparatus to work to my entire satisfaction for all minor blow-pipe operations.—*A. P., in American Artisan.*

SUBSTITUTE FOR OIL IN SHARPENING TOOLS.—Rub a little toilet-soap on your hone, or Arkansas stone. By moistening it with a few drops of water, it will then be found to work nearly or quite as well as oil, and is much cleaner.—*H. W., in American Artisan.*

EAST INDIA METHOD OF CLEANING SILVER.—The East Indian jewelers never touch silver-ware with any abrasive substance. For all articles of the kind, even the most delicate, the method of cleaning they adopt is as follows: Cut some juicy lemons in slices; with these rub any large silver or plated article briskly, and leave it hidden by the slices in a pan for a few hours. For delicate jewelry the Indians cut a large lime nearly in half, and insert the ornament; they then close up the halves tightly, and put it away for a few hours. The articles are then to be removed, rinsed in two or three waters, and consigned to a saucepan of nearly boiling soapsuds, well stirred about, taken out, again brushed, rinsed, and finally dried on a metal plate over hot water, finishing the process by a little rub of wash-leather (if smooth work). For very old, neglected, or corroded silver, dip the article with a slow stirring motion in a rather weak solution of cyanide potass.; but this process requires care and practice, as it is by dissolving off the dirty silver you obtain the effect. Green tamarind pods (oxalate of potash) are greater detergents of gold and silver articles than lemons, and are much more employed by the artisan for removal of oxides and fire-marks.—*Boston Journal of Chemistry.*

HINTS AND QUERIES.

What is the best treatment for alveolar abscess discharging through a tooth?—Delaware.

Can some of those who believe the rubber dam can be applied in all cases inform me how to apply it in the following case: tooth, inferior first molar, left side; cavity compound; distal and crown had been filled several years ago, but had decayed below the filling on the approximate side of the tooth? When ready for the dam, the lower edge of the cavity was on a line or a little below the neck of the tooth. I failed to get it on, or at least to get it below the bottom of the cavity, and keep it there.—Rubber Dam.

Can a broken mouth-piece of a double-valved inhaler be cemented together so that it will be useful, and how?—D. V. I.

How long will gas remain pure and efficient in a tin gasometer over six gallons of water?—N. O. G.

Is there any objection to the use of a brass faucet to connect the gasometer with the wash-bottles?—B. F.

Should a rubber inhaling-bag be washed every time the gas is emptied from it?—R. B.

If a portion of ammonia is left in the retort, should it be washed out, or may it be mixed with the ammonia used the next time?—N. A.

Will some one please give the manner of preparing Watt's crystal gold for use?—L.

Reply to "Celluloid."—"How can teeth be removed from an old celluloid plate without injury?" I will say that, by dipping the plate in hot water for a few seconds, they can easily be removed with the fingers; also that, when plates become loose, admitting too much lateral motion, they may be tightened by dipping the sides and edges in hot water, and pressing, to fit the contour of the gums.—E. A. V.

Reply to "Celluloid."—To remove the teeth from an old celluloid plate, without injuring them or the plate, simply place them in a tin cup holding sufficient water to cover the plate and teeth nicely; bring the water to a boil, when the plate will be found so much softened as to permit the easy removal of the teeth. Or, place in oil, and heat to 220° F., and the same result can be accomplished. I prefer water, as it is much cleaner.—L. Sydney Bell, *Salisbury, Md.*

REPLANTATION OF TEETH.—An article in the January number of the DENTAL COSMOS, on "Replantation of Teeth," leads me to state that in my practice replantation of teeth has nearly ceased to be an experiment. Within the last three years I have successfully performed the operation on five teeth (two for one patient). In each case the tooth was badly decayed, and the root ulcerated. After extracting and treating the tooth socket, I treated the root, and filled not only the cavity but the nerve canal in the root, and replaced the tooth, and without an exception each operation has been a perfect success.

The first patient whose tooth I treated in this way was a young man with whom I was very intimate; he had an ulcer, which gave him much trouble, on the superior incisor. It had been filled several times with different materials without satisfactory results, and he was obliged to have it extracted, and as an experiment I offered to undertake the operation of replacing it, after removing the ulcer and properly filling the tooth. The operation consumed about seventy minutes. There was much sensitiveness about the tooth at first, which soon subsided, and about a year afterward he had the other superior incisor treated in the same manner.

It is now over two years since the last operation, and, to use his own words, "They are the best teeth I have." Since then I have performed the operation on three different patients, and every case has proved a perfect success.—J. O. SMITH, *Babylon*, *L. I.*

TWO CASES IN PRACTICE.—About the 1st of February, 1872, a young man, aged sixteen, presented himself with a very unsightly tumor, the size of a common hickory-nut, located on the gum above the left cuspid and lateral incisor, buccal surface, of the superior maxillary. He said it had been twice removed with a knife by a surgeon of this city, and returned again each time within three months, growing larger than ever. Being somewhat discouraged, he called upon another physician, who referred him to me. We applied the ligature, and in five days it was removed without hemorrhage, and has not returned.

In April, 1872, a married woman, aged twenty-five, became much annoyed from the increasing size of a tumor located in the space left by the extraction of the dens sapientiæ of the inferior maxillary. We applied a ligature, and on the fourth day, after applying the second ligature, it disappeared down the alimentary canal. I use floss-silk for ligatures, so as to retain the first knot in place while we tie the second, if the tumor is large and requires more than one ligature to accomplish the object; in two days I tie another underneath the first, and so on, until I accomplish its strangulation.—L. N. HUTCHINSON, *Big Rapids*, *Mich.*

MR. B. desired to have the roots of a lower molar extracted, which a dentist had broken off six years ago.

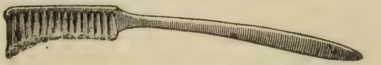
On December 10th I gave him nitrous oxide gas, which I had made the day before especially for him. He took the gas direct from a forty-gallon gasometer, using a double-valved mouth-piece. He took fifteen gallons, but it had apparently little effect on him. The roots were removed with but little difficulty, though with considerable pain, as they were badly diseased.

On December 26th he returned, stating that he had been confined to his room ever since the operation; that something had salivated him very badly; that his teeth had been very loose, and so sore that he could not use them; his mouth being very much blistered. He had used a mouth-wash of alum, borax, and honey. Dr. Akin, who administered the gas to him, had on the afternoon of the same day taken some of the same gas, and I extracted three roots for him without pain. Now, I want to know what salivated Mr. B.?—OREGON.

MANY of those who are using the electro-magnetic mallet complain of being annoyed by the wires connecting the mallet with the battery catching on their instruments, in the bracket, looping over different things about the cabinet and chair, and getting entangled in their patient's hands, etc. One-half of this annoyance may be done away with by sewing the wires together, leaving them as one wire, making them less flexible and more easily controlled.—W. M. REYNOLDS, M.D.

THE ART OF CLEANING THE TEETH.—Undoubtedly there are many gentlemen in the dental profession who do not impress upon their patients the importance of keeping the teeth clean. Now, I hold that I do my patients more real good by most thoroughly cleaning their teeth, and giving them the proper instructions which will enable them to keep them so, than I can do for them by filling one or several cavities. Let us see. If you fill a cavity in a tooth, and do your work as perfectly as it is possible for it to be done, you have done a good work; but suppose the patient has dark-green tartar around the teeth, and you dismiss him without properly cleaning those teeth; the little good you have done is *local;* while if you had properly cleaned the teeth, you would have been the means of saving not only one tooth, but many. Salivary calculus eats out the foundation upon which the teeth rest, and the varieties of tartar make a more or less straight line for the pulp. Therefore, if you desire to give your patients value for their money, clean the teeth thoroughly, and give them the necessary instructions how to keep them clean.

The art of cleaning teeth, I conceive, consists first in a properly shaped brush, and secondly, in the proper use of it. The most perfect tooth-brush that has yet been constructed, that I know of, is illustrated in the accompanying cut. The form is the essential point.



The bristles at the distal end are the longest.

The manner of using a brush should be a motion of the bristles from the gums down, on the superior teeth, and from the gums up, on the inferior. The reason for this movement is, that the bristles are enabled to reach more or less of the approximal surfaces, while the usual way of "swinging round the circle" only touches the convex portions of the buccal, lingual, or palatal walls. Dr. Delos Palmer, of New York, is the inventor of this peculiar brush, and it has only to be seen to be appreciated. A simple up-and-down movement of the wrist, and the distal end and the concavity will adjust themselves so perfectly to the teeth as to commend the form to every one.

But it will be of but little use to instruct patients how to keep their teeth clean, unless we first make them so ourselves. Remove all deposits, then polish with pumice, on a pine stick, or with the engine, as is most convenient. Provide your patient with a proper brush, and then the responsibility is with him.—W. IRVING THAYER, D.D.S., *Brooklyn, N. Y.*

THE

MOTION TO DISMISS APPEAL IN THE GARDNER SUIT.

THE affidavits were filed with the motion submitted to the Court on the 29th of October last (as noticed in the November number of the DENTAL COSMOS), and the Goodyear Dental Vulcanite Company, Mr. Bacon, and their counsel notified.

For a long time the Company took no steps towards meeting the motion, except by various suggestions involving a protracted series of proposed examinations, which, seeming unnecessary, were not concurred in by our counsel.

A motion for an examiner was presented on Friday, January 17th, by Charles F. Blake, Esq., of New York, on behalf of the Company and Mr. Bacon.

Reply was made on our side.

Since then, in response to a requirement of the Court, the Company by counsel appeared before them. The arguments are completed.

We now await with confidence the decision of the Court, which we hope to give in the April number of the DENTAL COSMOS, with the affidavits, motion, answer, etc., in full, which will be sufficient to occupy the entire number.

SAMUEL S. WHITE.

THE

DENTAL COSMOS.

VOL. XV. PHILADELPHIA, APRIL, 1873. No. 4.

United States Supreme Court.

No. 133, of December Term, 1871.

BENONI E. GARDNER,
Appellant,
AGAINST
THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.

PROCEEDINGS ON MOTION,

IN BEHALF OF

SAMUEL S. WHITE AND OTHERS,

TO DISMISS THE APPEAL, ETC.

ADJOURNED TERM, 1872.

JEREMIAH S. BLACK, HENRY BALDWIN, JR.,
OF COUNSEL.

United States Supreme Court.

No. 133. December Term, 1871.

BENONI E. GARDNER, *Appellant*, *vs.* THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.	*Motion to dismiss appeal.*

And now this twenty-ninth day of October, A.D. 1872, come before the court Jeremiah S. Black and Henry Baldwin, Jr., on behalf of Samuel S. White, of Philadelphia, Pennsylvania, and of many others, dentists, all citizens of the United States, and move the court to dismiss this appeal.

And in support of this motion they produce in court the affidavits of Benoni E. Gardner, this appellant, John B. Newbrough, Henry E. Fickett, Henry Coy, and Samuel S. White; and thereupon show the following facts:

1st. That there was no dispute between the plaintiffs and the defendant in the court below at the time the final decree was there made.

2d. That there was no dispute between the appellant and the appellees in this court at the time this appeal was taken, nor when it was argued.

3d. That the decree for damages and costs against the defendant in the court below was not and is not intended to be enforced, but that this appellant was and is protected against the same by agreements made in that behalf by the appellees before said decree was taken.

4th. That the injunction granted by the court below in its final decree was not and is not intended to be enforced, but that the appellant was protected against the same by a license granted in that behalf by the appellees before said decree was taken.

5th. That the appellant is not even liable for costs in this court, but that the same have been or are to be paid by the appellees.

6th. That the appellant here has no interest whatever in the questions involved in this appeal, nor in their determination; but that the appellees herein are attempting to procure the opinion of this court upon questions of law, in the decision of which their interest is opposed to that of other persons who are not parties to this suit, who had no knowledge of it while it was pending in the Circuit Court, and no opportunity of being heard in defense of their rights.

7th. That this cause was argued in the court below, and in this court, without there being any interest adverse to that of the appellees represented therein, and without there being even a colorable dispute, to obtain an opinion of this court, which the appellees desire to have in their own interest and for their own purposes, when there is no real and substantial controversy between them and the appellant, and no conflict between their interests; all the interest involved herein pertaining to the appellees, and that interest adverse to and in conflict with the interests of third parties, whose rights would be seriously impaired if the questions of law herein are decided in the manner in which these appellees have sought and are seeking to have them adjudicated upon this appeal.

8th. That the Goodyear Dental Vulcanite Company became and was in the court below, and has been and is in this court, the sole party in interest in this cause, and as such *dominus litis* on both sides thereof.

9th. That while this cause was pending in the court below the appellees became the legal and equitable owners of all and any opposing interest at any time involved therein; employed and paid counsel on both sides, and made up a record therein to suit themselves; in order to obtain an opinion of this court that should conclude the rights and interests of persons not parties to the pretended controversy.

Upon the facts above stated, the counsel named, on behalf of their clients aforesaid, move the court to strike out the judgment or decree heretofore made in the said cause, and to quash the appeal taken therein, direct the Circuit Court to dismiss the plaintiff's bill, and take such measures in the premises as justice and right may seem to require.

J. S. BLACK,
HENRY BALDWIN, Jr.

Indorsed: Supreme Court U. S., 1871, Dec. Term, No. 133. Gardner, app't *vs.* Dental Vulcanite Company. Motion to set aside decree and dismiss appeal. Filed 29th October, 1872.

True copy.
[SEAL.] Test.: D. W. Middleton,
Clerk Supreme Court U. S.

AFFIDAVITS, ETC., ON MOTION TO DISMISS APPEAL IN THE GARDNER SUIT.

The following affidavits were filed with the motion submitted to the court, and the Goodyear Dental Vulcanite Company, Mr. Bacon, and their counsel notified.

S. S. W.

UNITED STATES SUPREME COURT.

No. 133. December Term, 1871.

Benoni E. Gardner, *Appellant*, *vs.* The Goodyear Dental Vulcanite Company and Josiah Bacon.	*On motion to dismiss appeal.*

United States of America, Eastern District of Pennsylvania:

S. S. White, being duly affirmed, deposes and says: I am fifty years of age; reside in Philadelphia, and am a general manufacturer of and dealer in dental materials. I was formerly a practicing dentist; but since 1848 have devoted myself exclusively to my present line of business. My principal establishment is in Philadelphia; but I have branch houses in New York, Boston, and Chicago. In the course of my extended business I have become very generally acquainted with or known to the dental profession throughout the United States, who deal with one or the other of my houses, and who naturally, in the course of our dealings, have generally resorted to me for information and suggestions connected with almost every detail of the profession. These facts led me at an early period of my business (in order to disseminate such matters of interest more generally) to publish a periodical devoted exclusively to the interests of the profession, and affording facilities for intercommunication among the members of it. This publication was first designated the "Dental News Letter;" but, as in progress of time its scope was enlarged and extended, it has for the last fourteen years and upwards been entitled "The Dental Cosmos." With the growth of the facilities thus afforded, the resort to me for information and suggestions has continued and increased, and I have long occupied towards the profession generally the relations incident to this state of facts.

I have not at any time sold or manufactured for sale the artificial plates designated vulcanite, which have been the subject of so much litigation. I have never been involved directly or indirectly in any of that litigation. I am not and have not been a party to this suit, but have been involved to the following extent in the argument of the appeal before this court.

About the 20th December, 1871, my attention was called to a notice published in one of the New York papers, inviting the members of the dental profession to attend a meeting to be held at the Cooper Institute, on the afternoon of Saturday, Dec. 23d, and it was explained to me that the purpose of the meeting was to discuss and consider the relations between the profession and the Cummings patent for the vulcanite base, in view of the decision of Mr. Justice Clifford, in the Rhode Island suit between the Goodyear Dental Vulcanite Company and Dr. Gardner, and to hear a statement of the facts respecting an appeal of that case to the Supreme Court. My attendance was personally solicited as desirable. By reason of my influential position as publisher of "THE DENTAL COSMOS," and as being so extensively known to the dentists throughout the country, it was desirable to myself to improve such an opportunity of learning facts on a subject of such general interest and so frequently inquired about, and with this view I attended that meeting, which was presided over by one of the three New York dentists who issued the public call. The proceedings of the meeting were such as are indicated with sufficient fullness in publications made soon thereafter, and copies of which are hereto annexed, marked respectively Exhibits A, B, C, and D, and these publications further show my entire connection with this matter up to the time when the appeal was argued. Before that I had never seen Dr. Gardner nor communicated with him.

On or about the 6th of June last, having, after the argument of the appeal, learned circumstances which led me to doubt the verity of the appeal, I sought out Dr. Gardner, and for the first time learned that he had really no part or place in the matter, but that his name had been used for purposes and to an extent not known to himself. Before seeking him, I had learned the facts respecting the conduct of the proceedings in the Circuit Court, as shown by the affidavit of Dr. Newbrough and the exhibits annexed thereto and filed herewith. Dr. Gardner's affidavit, also filed herewith, gives the facts as to his relation to the case; and other affidavits, also filed herewith, show the course of the developments which have led me to the submission of this motion, which is made because I believe and charge,—

First. That there was no real dispute between the plaintiff and defendant below at the time of the final decree there made.

Second. That the appellant here has no interest in the questions involved or in their decision, but that the appellees herein are attempting to procure the opinion of this court upon questions of law, in the decision of which their interest is opposed to that of other persons who are not parties to this suit, who had no knowledge of it while it was pending in the Circuit Court, and no opportunity of being heard there in defense of their rights.

Third. That this case was brought here without there being any interest adverse to the appellees represented herein, and without there being even a colorable dispute, to obtain the opinion of this court, which the appellees desire to have for their own interest and their own purposes, when there is no real and substantial controversy between them and the appellant,—no real conflict of interests between them,—but that all the interest herein pertains to the appellees, and that interest is adverse to and in conflict with the interests of third persons, whose rights would be seriously and adversely affected if the questions of law are decided in the manner that the parties, appellees, desire them to be.

Fourth. That the appellees have purchased and taken an assignment of all Dr. Newbrough's interest in the Haering patent, and of any other interest he had or might have in the decree appealed from; the appellant having no interest whatever therein.

Fifth. The appellees became, and were, as well in the court below as in this court, sole party in interest, and as such *dominus litis* on both sides.

Sixth. That while this cause was pending in the court below, the appellees became the legal or equitable owners of any and all opposing interests therein: employed or paid counsel both sides thereof, and made up a record to suit themselves in order to obtain an opinion of this court affecting the rights and interests of persons not parties to the pretended controversy.

Seventh. That the appellees, before the final decree below, had purchased the Haering patent under which Dr. Newbrough had sought to protect his licensee the appellant; and that Dr. Newbrough had acquired an interest in the Goodyear Dental Vulcanite Company, which is now one of these appellees, such interest having been acquired by him prior to the final decree below.

Eighth. That the decree for damages against the appellant was not and was not intended to be enforced, but that the appellant is protected against the same by license from the appellees; such license having been granted before the decree was taken, and any claim for damages thereby waived.

Ninth. That the costs below and in this court have been or are to be paid by the appellees, and not by the appellant.

For all of which reasons it is respectfully submitted to this honorable court that this appeal should be dismissed.

SAMUEL S. WHITE.

Subscribed and affirmed to
before me, this 26th day of
October, A.D. 1872.

ORLANDO G. HEMPSTEAD,
Notary Public.

[*Exhibit A.*]

BENONI E. GARDNER'S APPEAL.

We attended a meeting of dentists in New York on Saturday, December 23d, which was called with reference to the Benoni E. Gardner appeal case. This case is an appeal from the decision of the U. S. District Court which reaffirms the validity of the Cummings patent, previously sustained in the famous Wetherbee case. Gardner's appeal is taken to the Supreme Court of the U. S. for the purpose of reversing this decision. It is set down for a hearing during this present month of January, 1872.

Nothing could be more desirable than that Gardner's case should be ably argued. The object of this meeting was stated to be for the employment of counsel of high ability to work on it to defeat the patent. Speeches were made by Dr. Dwinelle, Col. John A. Foster, Samuel J. Glassey, myself, and others, tending to explain and elucidate the case and stir up those present to action.

A committee was appointed to report at a future meeting the course of action which the profession in interest ought to adopt in order to aid effectually in this tempting opportunity to destroy forever this old man of the sea.

The committee have called an "adjourned Mass Meeting of the members of the Dental Profession of New York and Brooklyn, which will be held in the Lecture Room of the New York College of Dentistry on Wednesday, January 3d, at 7½ P.M.

"The object of this meeting is to hear the report of the committee appointed at the last meeting, and to devise means for testing the validity of the Cummings Dental Vulcanite Patent."

All new developments will be duly reported in the next number.

Up to the last moment it was hoped that a report of the proceedings made for the newspaper press would be obtained; therefore the above hasty summary is all that can be offered. S. S. W.

—*Dental Cosmos for January*, 1872.

[*Exhibit B.*]

THE CUMMINGS PATENT.

New York, Jan. 18th, 1872.

Dr. S. S. White:

Dear Sir,—In reply to your inquiry as to what action has been taken by the profession in New York and vicinity, I will state to you, as concisely as possible, what has been accomplished so far, and what are the plans for the future.

At the first meeting, held December 23d, 1871, a statement somewhat in detail was made by Mr. Foster, both as to the merits of the case, and the chances of a successful issue in the suit of Dr. Gardner, now on the calendar of the United States Supreme Court; and also of the necessity of immediate action on the part of the dentists to prevent a decision adverse to themselves, regarding this both as a test case and a final one.

A committee was appointed to consult with Mr. Foster in regard to his views and terms, and if it seemed well to co-operate, to devise ways and means to defray the expenses of the suit.

The committee reported at the next meeting, held Wednesday evening, January 3d, that they had had an interview with Mr. Foster, and that his propositions were: First. That for one thousand dollars cash (about five hundred dollars of which would be needed in the preparation of documents for the court), he would carry the case through, provided there was no withdrawal on the part of Dr. Gardner. Second. Should the Cummings patent be declared void, he should expect a fee of twenty-five hundred dollars, and as much more as the liberality (and, I will add, the obligations) of the members of the profession would bestow. Should the court sustain the Cummings patent, no further claim for compensation would be made upon the dentists.

The committee recommended that the one thousand dollars should be raised by immediate cash contributions by every member of the profession who could be reached.

Also, that provision should be made for the additional twenty-five hundred dollars, and as much more as possible, by a system of notes, payable on condition, and not until the Cummings patent should be declared void.

The report of the committee was accepted, and the committee was desired to continue as the Executive Committee of the organization.

Five new members were added: Drs. Hill, Francis, Kingsley, Crane, and Blodgett.

Dr. S. A. Main was elected Treasurer.

It was then resolved that the profession, as represented by the meeting, associate themselves in the case of Dr. Gardner, and that the committee be authorized to employ Mr. Foster as counsel, on the terms proposed.

They were empowered to obtain, if possible, some pledge from Dr. Gardner to the profession, in addition to that already given his counsel, that he would not withdraw the suit. (This pledge has been obtained.)

The proposition that every member should refuse to take a license was received with acclamation.

I think this covers all the important measures suggested and adopted at that meeting.

It will be seen from this that if all the members of the profession will contribute, the burden to each individual will be exceedingly small, especially when compared with the chance of an exemption from the rubber tax. It is hoped that every dentist will be eager to share his part in the risk. Respectfully,

E. H. RAYMOND, *Secretary*,
28 E. Thirteenth St., New York.

The following communications were received after the last form of this number was ready for press. We have added the pages required in order to give them early circulation.—ED.

The Committee of the Dentists of New York and Brooklyn take pleasure in acknowledging the receipt of the following communication for publication in "THE DENTAL COSMOS," and which is, for the most part, made up from the records of the cases now before the United States Supreme Court.

It is very timely and straightforward in its statements, and is laid before the profession in the hope that it may, if possible, increase the energy and strengthen the hope,—we trust well founded,—in the efforts now being so widely made, to free ourselves from an unjust and onerous tax.

The Committee also desire, on behalf of the dentists, to acknowledge the liberality and the fraternal spirit with which Dr. S. S. White is aiding in the present exigency. While he carefully disclaims any indorsement of the Dr. B. E. Gardner appeal, he has contributed generously to the first amount, which it was necessary to raise immediately, because he wishes to aid us in doing all that it is possible for us to do under the circumstances.

The brief period between the appointment of the Committee and the calling of the case for trial (which is likely to be reached by February 15th) made it impossible for societies at a distance to so mature their plans that they could employ additional counsel in time to permit them to study the case.

In this emergency Dr. S. S. White, having been informed that Hon. S. S. Fisher, who had studied the case thoroughly while working as chief counsel for the dentists of the West, has taken a retainer from Bacon to go on the shelf, and fearing that the case might be lost for want of proper watchfulness, and hoping to avoid the hearing if it should be found that it could not be properly presented, while utterly declining to influence any other person to aid or subscribe to the maintenance of this defense, proposed to the Committee to employ, at his own personal cost, counsel of eminent ability to be associated with Col. Foster.

This offer the Committee thankfully accepted. Calling upon Col. Foster with Dr. W., he offered an eminent practitioner of Philadelphia as associate counsel, who was promptly and fully accepted as such by him.

W. A. BRONSON,
Sec. of Committee.

[*Communication.*]

The importance of the appeal now pending in the Supreme Court of the United States, instituted to declare this patent null and void, cannot be overestimated. Considering that of the twelve thousand dentists in the United States, at least one-half, in their practice, use hard rubber, or vulcanite, for dental plates, and estimating the royalty at $75, we would have an annual tax on the profession of $450,000, and this when the patent is in litigation. How much will it be when Josiah Bacon has a decree of the Supreme Court of the United States sustaining the patent?

The case of the Goodyear Dental Vulcanite Company *vs.* Benoni E. Gardner has been selected by the dental profession as a test case, and, if successful, will relieve the profession from all future exactions.

On the 6th of May, 1872, the hard rubber patent of Nelson Goodyear will expire by its own limitation, and thenceforth Bacon must rely solely upon the Cummings patent to tax and drain the profession, and they must now present a united front, if they expect to succeed.

A short statement of the claim of Cummings for his letters patent, his mode of obtaining them, and the defenses now presented, will enable the reader to judge of the probability of success in this appeal.

Cummings claims that he is the original inventor of the application of hard rubber for dental plates, and his whole claim hangs on the truth of this assertion. He filed a caveat in 1852, in which he states that he has discovered such an application, and wants time to perfect his invention. He applied for a patent in 1855; it is rejected. He appeals to the Board of Examiners, who reject it, and the Commissioner affirms the rejection in February, 1856. He does nothing until in 1859, when he attempts to withdraw his application, which is refused, because it has been finally rejected, when he again lies still until in 1864, when he makes a new application before a new commissioner, and obtains a patent.

The defenses, all of which are proved in the Gardner case, are many. We will give a few:

First. Cummings was not the first one to apply vulcanite to dentistry. Perhaps if he had discovered a *new process* of applying this he might have properly claimed a patent; but he claimed *no* process, merely the bare application of this substance as a basis for dental plates.

This application was the subject of letters patent to Dr. Truman, in England, in 1848, who, at the World's Fair in London, 1851, received the highest medals for his plates, which were then eulogized by the Jury of Examination for their perfect workmanship and utility. In

1850 letters patent were granted in Paris. In the year 1851 Dr. De La Barre read a long article before the Academy of Sciences of France, giving the details of his method of using it Dr Evans had used it in Paris in 1848, and made several sets of teeth for Goodyear in 1851. As early as 1845 Dr. Berend, of Liverpool, was using it, and Dr. John Lovejoy was doing the same thing in New York City the same year. It was described in the various journals of Europe and the United States. Cummings claims in his caveat, in 1852, that he has just discovered his application, but has not perfected it, showing that he could not then do it himself.

Second. It was shown that Cummings himself did not make a dental plate even up to the date of his patent. He was obliged to obtain the plates he used in his application for a patent of one Robert Haering, Dr. Mallett, of New Haven, and Wm. A. Bevens, a workman in Goodyear's shop, in New Haven.

Third. His original patent was for an application, and without disclosing any process to manufacture a plate. It is a familiar principle of patent law that a known article or substance, applied to a well-known manufacture or use, is not the subject of letters patent. It is not patentable to merely apply the known article to a new use; and this is all Cummings did in his first patent.

Accordingly, in a few months he surrendered his patent, and obtained a reissue, which, for the first time, detailed any *process* by which such plate could be made, and now they are claiming that Cummings invented this *new process*.

Fourth. That this *process* was one well known to dentists as early as in 1856, and many were practicing it throughout the United States. In fact, Cummings was almost the only *one who* was not familiar with this process years prior to his letters patent.

Fifth. Had Cummings been the inventor and discoverer both of the application and this *process*, he clearly would not have abandoned it to the public. For eight years after the rejection of his application he allowed all the profession to use it, made no claim to any rights under it, but acquiesced, and announced to them that he had tried it and failed.

When the Hard Rubber Company sold licenses for the use of rubber, *he took a license* from them. When his assistant wished to use it in 1860, he could not teach him how to make it, and employed and paid a young man to instruct him in the art. Unquestionably the idea of getting the patent in 1864 had never occurred to him as late as 1862, and probably dates from his acquaintance with Josiah Bacon.

To claim that he did not abandon to the public necessitates the proposition that he *could* not abandon it, as he did all he could to show such abandonment.

Sixth. The reissue was a different invention from the original patent, which would render it void. If the first patent was merely for the application, and this was not patentable, then the reissue could not be so by inserting in it a new and patentable claim. A patent cannot be issued for an invention which the inventor has suffered to go into public use for two years; and he must apply for his patent within two years after making his invention. If his original invention of 1856 was for a *process*, then his reissue of 1865 was practically a new invention, and had been suffered to go into public use more than two years, and hence was void.

Seventh. Two other objections, technical in their nature, but fatal if well taken, are that the original company, the Dental Vulcanite Company, incorporated under the Massachusetts law, and the present company, the Goodyear Dental Vulcanite Company, incorporated under the New York manufacturing act, are each incorporated merely and solely for *manufacturing purposes*, and any business they attempt beyond those mentioned in this charter is *ultra vires*. Hence they would have no legal capacity to enter into the business of selling licenses to dentists; and the reissued patent, which is the only one they now own, being issued to a corporation who had no capacity to receive it, is void. For, if the corporation cannot receive it, they cannot use it, or even sell it.

There are other points relied upon; but the above present those most important, and either of which is believed to be fatal to the claims of the company and Bacon.

All the facts upon which the above are based were fully proved, and none were *contradicted*.

Unquestionably the fact of abandonment is the most palpable one, and, coupled with the refusal to call, or suffer to be called, Cummings as a witness to prove by him his intention to claim his invention during the eight years' abandonment, and his failure to deny his ignorance of the *process*, seems to leave the Supreme Court no option but to reverse Judge Clifford, and relieve the profession from this incubus.

The dentists of New York and Brooklyn have assumed the burden of this fight. They call upon the profession to sustain them. They ask no assistance except in the event of success. But they do believe that all high-minded members of the profession will aid them as well as sympathize with them in their labors.

—*Dental Cosmos for February*, 1872.

[*Exhibit C.*]

We desire it to be distinctly understood that neither Publisher nor Editor of "The Dental Cosmos" is in any way committed as to the wisdom of any action, or correctness of any opinion, in reference to the

Cummings patent and the cases under it, or as to the hope of any relief to dentists from anything done or being done.

Whatever in the present or in any subsequent number of "THE DENTAL COSMOS" may appear, over the signatures of others, or prepared by others for publication, will have place as a part of the history of this painful case, without implying approval or dissent.—S. S. W.

—*Dental Cosmos for February*, 1872.

[*Exhibit D.*]

SUPREME COURT OF THE UNITED STATES.

No. 133.—*Gardner* vs. *Goodyear Dental Vulcanite Company et al.* Appeal from the Circuit Court for the District of Rhode Island.—This is a suit brought by the Goodyear Dental Vulcanite Company against Gardner, a dentist practicing in Providence, for an alleged infringement of a certain patent issued to one John A. Cummings, in June, 1864, for making dental plates of hard or vulcanized rubber. The case went against Gardner below, and it is here contended that the invention patented by Cummings is not legally the subject of letters patent because it consists in the mere substitution of particular material for other material which had been previously used for the same purpose in the same way, and that reissue of the same involved in the suit is not for the same invention for which the original patent was issued. Also, that John A. Cummings was not the original or first inventor of the improvements patented. It is also urged that the Goodyear Dental Vulcanite Company is not a corporation competent to take and hold a patent; and that the reissue obtained by the Goodyear Dental Vulcanite Company is void, because the original patent was not surrendered according to law. It is urged further that the Company is not the owner of the patent.

This case was argued on Monday, March 18th.

John A. Foster and Samuel J. Glassey, of New York, counsel of the New York Committee, and B. F. Horwitz, of Baltimore, counsel of Baltimore and Washington Committee, all for appellant; Causten Browne and B. R. Curtis for appellees.

The argument on this case is in. It remains now with the court to make and announce its decision. Such decisions are usually made in about two weeks after argument. No sane man will think that the decision of this case will be any other than a just one. By this we mean, that in exact accordance with the weight of law and testimony as presented in the briefs, points, and arguments of the advocates, as limited by the record, this decision will come forth. If there existed proof which had value, and it was not put in, or if there was law which might have been applied and it was not cited, on either side, the opportunity is lost. The case will be decided fairly as presented, and according to the weight and within the limits of the presentment.

We have at this writing no such full report as would justify a prejudgment or calculation of what, from the weight and ability of the arguments on both sides, this decision is likely to be. We have only the statement of a legal gentleman who was present during nearly all of the argument, and who, knowing our deep interest in it, has given us a recital of his recollections. We deem it imprudent to repeat the statement as he made it, or to give currency to his anticipation of the result; but it not being possible now to prejudice the case in any way, it is a duty incumbent on us to say here—not knowing whether the result will be favorable or adverse to the dental profession—that for many reasons we were always opposed to having this Gardner appeal case go to final hearing. Even if it succeeds, and the Cummings patent is declared bad, and thereby made void forever, the risk was too great.

This appeal case was forced upon the dental profession fully made up, loaded with stipulations which were manifestly in favor of the Bacon party, and when but a brief period remained before the hearing. The profession was cornered, and must intrust the full case in the hands of those who controlled this appeal, and be concluded thereby if they joined in it, or be concluded by default if they refused to join. This was to our minds a situation into which the dental profession need never have been put, and into which those who did it had no right to put them.

That we subscribed some money to aid our friends who were in, and to gain such a standing with those who were conducting it as would enable us to reinforce them and make the case for the dentist as strong and safe as under the circumstances it could be made, was one thing; that having done this, we utterly refused to indorse statements which we knew to be false, or to induce a single person by our example to put a dollar into it except on his own individual judgment, was another thing; we did both. We have been pretty liberally censured for both—separately; but we submit to no censure in this matter. Win or lose, in the case our conduct has been sincere, straightforward, and consistent with the knowledge in our possession, the full statement of which will justify this assertion; but we feel constrained to withhold it until after the decision is made.—S. S. W.

REPORT OF THE HEARING.

SINCE the preceding article was written and printed we have received additional information of great moment, as reflecting the impressions and hopes of several members of the profession who attended the hearing of the Gardner appeal case, in Washington, as deeply interested listeners. These gentlemen, being members of several committees representing a large number of contributors to the maintenance of the appeal, have reported that they are well satisfied with the zeal and ability manifested in its presentment to the court by their advocates.

We are glad to know that these intelligent gentlemen hope for success. They are free from the fears that beset us so strongly. We concede to them (as they have had so favorable an opportunity to judge of it) the last word in our report of this case. They all express anticipations of victory, which we fervently hope may be realized.

If space permitted, we would like to publish several letters from those who were present; they are full of good cheer at the prospect of the odious tyranny of the Bacon party being cut up by the roots.

We yield a cheerful compliance to the request of the New York and Brooklyn Executive Committee, by publishing the following notice of their meeting and the resolutions passed. We have stopped the press and displaced advertisements (the other forms being all worked off) to give room for them.

The interest felt by dentists in every section of the country in all that pertains to this question is our sufficient apology for any delay caused by the effort to furnish the latest news.—S. S. W.

RESOLUTIONS OF NEW YORK AND BROOKLYN EXECUTIVE COMMITTEE.

At a meeting of the Executive Committee of New York and Brooklyn, March 21st, 1872, to hear the report of the delegates to Washington, the following resolutions were adopted, and it was desired that copies should be sent to the dental journals for publication, as a tribute eminently due to the gentlemen mentioned:

Resolved, That the energy, ability, and integrity which have been shown by our counsel, General John A. Foster and Samuel J. Glassey, Esq., in the preparation and presentation of the case of B. E. Gardner against the Cummings patent, just argued in the U. S. Supreme Court at Washington, entitle them to this recognition of their services by the Committee, and merit this public acknowledgment of their untiring labor and skillful management of the case. Also,

Resolved, That the Committee gladly recognize their obligations to the gentlemen of the Baltimore and Washington Committees, and to their counsel, Orville Horwitz, Esq., for the efficient support they have so promptly and cheerfully given to the measures which it is hoped will result in our speedy and final success.

C. A. Woodward, *Chairman.*
W. A. Bronson, *Secretary.*

New York, March 23d, 1872.

—*Dental Cosmos for April*, 1872.

UNITED STATES SUPREME COURT.

No. 133. December Term, 1871.

BENONI E. GARDNER, *Appellant,* *vs.* THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.	*On motion to dismiss appeal.*

United States of America, Eastern District of Pennsylvania:

Benoni E. Gardner, having been duly sworn, deposes and says: My name is Benoni E. Gardner; I am forty-nine years of age; reside at Bricksburg, N. J. For twenty-seven years I was a practicing dentist, but since April last I have retired from that practice. In the fall of 1861 I went to Providence, R. I., and there practiced my profession up to last April. During my residence at Providence I was sued in the United States Circuit Court of the District of Rhode Island for infringing, as alleged, the Cummings patent for the vulcanite base for artificial teeth. That was the beginning of the suit upon which this appeal is founded. I was not at that time using the vulcanite, but was using an article called iodized rubber, which had been patented by Dr. J. B. Newbrough. I had obtained a formal license from Dr. Newbrough under his patents, and when I was served with process in the suit above mentioned, I sent the writ to him and asked his advice what to do. He then resided at New York City. In response to that I was called upon by Mr. John A. Foster, as solicitor for Dr. Newbrough. From this time forward Dr. Newbrough assumed my defense, and conducted the case without reference to myself. I did not interfere or have anything to do with it. I never retained or employed any counsel in the matter. Under the advice of Dr. Newbrough and his counsel, I continued right along to use the Newbrough compound until the injunction was granted in the case. Afterwards I used the vulcanite or the iodized rubber indifferently under the following circumstances. When the injunction was served on me, I notified Dr. Newbrough and inquired of him what I should do. He sent me a license under the Haering patent, and under that license, and pursuant to the advice of one of Dr. Newbrough's counsel, I continued my use as above stated. I was never disturbed in my use.

I should also state that after the injunction, to wit, some time in the fall of 1869, Dr. Newbrough told me that, having found himself unable to carry the defense further, he was unwilling to defray the expense of an appeal to the Supreme Court; he had made the best terms he could with the Dental Vulcanite Company, and had made provision for me to continue my use. From that time forward, as before that time, I never had anything to do with the suit, and beyond the service of the writ and the injunction, never knew anything of the proceedings therein until about the fall of 1870, when I signed the appeal to this court, at the request of Mr. Jabez Holmes, acting as agent or attorney of Josiah Bacon, because he promised me a protection from Bacon, and told me that the appeal was desired by both parties; Dr. Newbrough was spoken of as the other party. I was only considered as nominal defendant. I never paid one dollar costs or expenses, and never considered that I had a dollar of interest in the decision; I certainly have none in the litigation or in its decision. I allowed the case to be carried on by Dr. Newbrough, because I was his licensee as above stated, and he assumed the defense, as I have already explained. I know nothing as to what disbursements Dr. Newbrough may have made in the conduct of the case.

I refused to sign the appeal except upon Mr. Holmes's assurance that I should have a writing from Mr. Bacon, as treasurer of the Goodyear Dental Vulcanite Company, which I considered made me safe from being put to costs, or liable to pay any damage, if the appeal was decided in their favor. I never had any idea or understanding of the reason of the appeal to the Supreme Court, except what Mr. Holmes told me at that time, until recently.

I now think, from information acquired since the appeal was argued, that my name was used in carrying on the suit after Dr. Newbrough settled with the Company as if I was the defendant, when in fact I was not defendant nor defending; yet I did not knowingly or willfully consent to the collusion. I supposed only that the appeal was taken to determine whether the Haering patent owned by Dr. Newbrough, or the Cummings patent owned by the Goodyear Dental Vulcanite Company, had the best title, and that idea was what was in my mind when I agreed to sign the appeal at Mr. Holmes's request.

I provided no security in the appeal, and don't know Henry W. Gardner, nor how he came to give a bond on the appeal. I don't know that I ever saw him, and certainly never requested him or anybody else to go my security, as he seems to have done.

I hereto append a copy (marked "A") of a letter received from Mr. Bacon, after I had complied with Mr. Holmes's request as to the appeal.

From the time when Mr. Foster called to see me after I sent the writ to Dr. Newbrough, I had no communication or intercourse with him until after the injunction was served, when I went to see him in New York, at Dr. Newbrough's request. That was at the time Dr. Newbrough informed me he had made provision for me in his arrangement with the Company.

After I had signed the appeal, Mr. Foster, in November, 1870, wrote me for an order to carry through the appeal. At the time Mr. Holmes asked me to sign the appeal, he said they wanted the case appealed, and that Dr. Newbrough agreed with them in wishing it carried to the Supreme Court. In reply to my expression of surprise that a party who had won a suit should want to appeal it, or have the defendant against whom they had gained the case to appeal it, he replied that both parties desired to have the case appealed,—and by the other party was meant and understood Dr. Newbrough, and not myself. I supposed the question between them as to the Haering patent could not be settled until they had a decision upon that from the court of last resort. I did not believe that it meant any more than an amicable suit between the Goodyear Dental Vulcanite Company and Newbrough in my name, to determine which was the patent which would hold good, Cummings's or Haering's.

In November, 1870, I received from Mr. Foster a letter, of which I annex a copy hereto (marked "B"). As I knew Mr. Foster had been counsel for Dr. Newbrough in my case and in some others which he had had, and as I understood Dr. Newbrough wanted my case appealed, I sent Mr. Foster an order to attend to the appeal, as he requested; but beyond this I did not employ him, and his letter shows he did not look to me for his fees.

So far as I have been or am concerned, the case was ended and determined by the settlement and arrangement made by Dr. Newbrough, and comprising the provision for my continued use of rubber plates; and from that time to this I have known but little or nothing about it until last winter, when Dr. Morey came to me and represented the case as likely to hurt the dentists if a default was allowed, and that Mr. Foster was going against the Cummings patent. I took the word of the Committee as to the state of the case; and not wishing to do anything to prejudice the interests of my brother dentists, I agreed with the Committee not to withdraw the appeal if they would not put me in for costs.

Upon this understanding the Committee arranged with Mr. Foster for arguing the appeal, as I suppose from the letters, copies of which are hereto annexed (marked "C" and "D"), and which contain all the information I have on that subject, and show all I have done in this connection.

Early in June of the present year inquiries were made of me respecting the facts of my relation to this suit, as well in the court below as in the Supreme Court, and on or about the sixth day of June, 1872, I embodied in a statement some of the facts above set forth, and in a letter of the same date I gave a more extended outline of all the facts substantially, as hereinbefore contained. This letter was addressed to Dr. S. S. White, of Philadelphia, and was intended by me as an explanation to my brethren of the dental profession, whom it would reach through the pages of "THE DENTAL COSMOS," and to whom I thus would be enabled to explain how it had happened that my name had been used in a manner so different from my own purpose, knowledge, or desire, to affect adversely their rights and interests.

I felt that Dr. White, as a representative of the profession at large, having their entire confidence, and as publisher of "THE DENTAL COSMOS," was a proper medium through which to communicate the facts which they were entitled to know, and which it was necessary they should know, to understand my true position; and, in case it was not too late, that they might avail themselves of these facts, in any proper manner, for their protection against an adjudication, obtained under the circumstances I have set forth, and extending so far beyond what I had regarded as the real question at issue, *to wit*, the question of priority, as between Haering and Cummings. Prior to this time I had not communicated these facts to Dr. White, nor to any one else, having had no occasion to put myself forward in the litigation, and no opportunity of knowing the course of the proceedings therein.

In the foregoing statement the injunction mentioned by me is the preliminary injunction granted in 1868. I think that another injunction was served on me in 1870, after the decision. I have carefully read the foregoing statement, which was reduced to writing in my presence, and embodies what I have dictated; and these statements are the simple truth, to the best of my knowledge, information, and belief.

BENONI E. GARDNER.

[SEAL.] Subscribed and sworn to
before me, this 24th day
of October, A.D. 1872.

SAMUEL L. TAYLOR,
Notary Public.

[A.]

GOODYEAR DENTAL VULCANITE COMPANY, JOSIAH BACON, *Treasurer*, No. 5 TEMPLE PLACE, BOSTON, MASS., No. 38 PARK ROW, NEW YORK.

BOSTON, *September* 21, 1870.

DR. BENONI E. GARDNER, Providence, R. I.

DEAR SIR,—I have had some conversation with Jabez Holmes, Esq., my attorney, in regard to the appeal of the suit decided against you and your liability for the costs thereof.

I will therefore say to you frankly that, though the suit is against you in name, yet Dr. John B. Newbrough is the real defendant in the case, and is defending it, and you are only the nominal defendant. I do *not*, therefore, hold *you* responsible for the costs, etc., but I *do*, most distinctly, hold said Newbrough responsible for both costs and damages to the uttermost dollar. The suit was appealed by Newbrough in your name, as both parties thereto wished the matter passed upon by a court of final jurisdiction, as the patents of Newbrough are either paramount or subordinate to ours, and the question must be fully decided.

In regard to your own position, permit me also to add that you are now under perpetual injunction by the United States Court forbidding you the use of any rubber whatever, either iodized or any other kind, and any use thereof by you will subject you to a heavy punishment by the court.

Your neighbor dentists have often told me you were using, but I paid but little heed thereto in view of your position as defendant in this; but let it pass by. Understand me now, however, *very distinctly* to say, that proof of a single *plate made by you after this date* I will instantly act upon and lay before the court, demanding an exemplary penalty. Be very careful now, therefore, of your acts, for you are fairly warned and can ask no consideration.

I advise your calling to see me, at this office, at the earliest opportunity.

Yours respectfully,
JOSIAH BACON, Treas.

[B.]

LAW OFFICES OF JOHN A. FOSTER, COUNSELLOR-AT-LAW, 7 WARREN STREET.

NEW YORK, *November* 23, 1870.

BENONI E. GARDNER, Esq.:

DEAR SIR,—The record in appeal to the Supreme Court of the United States, in your case with the Goodyear Dental Vulcanite Company, was sent me yesterday.

Though I presume my present retainer is sufficient to carry it through, yet I would like a further order on appeal, and you will please send it me.

Of course I look for my fees, as before, to your licenser, Dr. John B. Newbrough.

Very truly yours,
JOHN A. FOSTER.

[C.]

New York, January, 1872.

Benoni E. Gardner, Esq.:

Dear Sir,—A number of the dental profession in the city of New York intend to support you in your appeal to the Supreme Court in the case against you by the Goodyear Dental Vulcanite Company, and wish to know whether you intend to prosecute the case.

This will introduce to you Dr. Morey, who is one of the Committee, who are desirous of knowing from yourself your intentions.

Your case will be reached the end of this month, and if properly pressed should succeed.

Please give the doctor all information.

Very truly yours,
John A. Foster.

(*Indorsed.*)

Providence, Jan. 8, 1872.

I agree to have the suit against me carried on to the final end in the Supreme Court, in consideration that the Committee for the dentists in common pay the expenses and fees for counsel.

B. E. Gardner.

[D.]

No. 19 Park Place,
New York, January 24, 1872.

Benoni E. Gardner, Esq.:

Dear Sir,—I am requested, by the Committee for the Dentists, to inform you that they acknowledge the receipt of the proposition made by you in relation to their assuming the expenses of counsel fees, etc., in conducting the final appeal of the case of the Goodyear Dental Vulcanite Company against yourself to the Supreme Court of the United States, and that they have accepted the same, and have complied with it by paying my counsel fees for the argument, etc.; and the appeal will be argued at the present term of the Supreme Court.

Trusting that I may soon inform you of a favorable result of the same,

I remain, truly yours,
John A. Foster.

UNITED STATES SUPREME COURT.

No. 133. December Term, 1871.

Benoni E. Gardner, *Appellant*, *vs.* The Goodyear Dental Vulcanite Company and Josiah Bacon.	*On motion to dismiss appeal.*

United States of America, Southern District of New York:

John B. Newbrough, having been duly sworn under the above caption, deposes and says: My name is John B. Newbrough; am forty-five years of age, and a practicing dentist in the city of New York; have been so practicing during the last nine years. Before the 16th of September, 1868, I had invented and patented, and had purchased inventions patented by others for, several improvements in the treatment of caoutchouc, gutta-percha, and similar gums, and the manufacture of articles therefrom. Among other articles manufactured by me under these patents were dental plates or bases for artificial teeth, and I introduced such plates to the dentists and licensed several to make them under my patent. Among my licensees was Dr. Benoni E. Gardner, of Providence, Rhode Island.

In September, 1868, Dr. Gardner sent me a writ which had been served upon him at the suit of the Goodyear Dental Vulcanite Company and Josiah Bacon, under the Cummings patent, then and theretofore well known to the profession as the Vulcanite Base Patent.

Having been advised that my patents and their use involved no infringement of the Cummings patent, I was not unprepared for litigation, and promptly assumed the defense of my licensee, Dr. Gardner. I sent one of my counsel, John A. Foster, Esq., to see Dr. Gardner and to ascertain if the doctor was using my preparations and not using the vulcanite of the Cummings patent, and in case he was using my preparation as licensed by me, to employ local counsel for defending the suit; and from that time I took the entire charge of the defense of that suit. The answer was filed after a preliminary injunction had been granted after argument. This ended the proceedings in the Gardner case, except as hereinafter explained. Previous to the Gardner suit in Rhode Island, the same complainants had sued me in this district, and I was proceeding duly with my defense.

No testimony was ever taken in the Gardner case except the affidavits used on the motion for the injunction, but all the testimony that afterwards went to make up the Gardner record was stipulated into it out of other suits. On the 1st day of July, A.D. 1869, a written compromise was executed between the Goodyear Dental Vulcanite Company, Josiah Bacon, and John H. Cheever, Henry E. Fickett, and myself, dismissing all the suits then pending against myself, and I introduced into that compromise the dismissal of the suit against Gardner also, because, as I was the real defendant of his case, I regarded that as involving myself, and so settled it in the above-mentioned compromise, by giving him a free license during the term of all the Goodyear Dental Vulcanite Company's patents. I also conveyed to the Company all my patents, and took an interest in the Company from the date of that compromise, under conditions and terms which will fully appear upon reference to the original duplicate thereof as executed by the parties thereto, at the date above mentioned and hereto annexed, marked "Exhibit A," and made part of this affidavit. With the execution of this writing all the then pending questions between the Company, my licensees, and myself were finally settled and terminated, and from that time forward I have not in any manner controlled, directed, or participated in any defense or proceedings in the Gardner or the other suits above mentioned; but, on the contrary, my only interest in any of the matters has been that which I had in common with the Company itself under the aforesaid compromise (Exhibit A). I have never employed nor paid any counsel to do anything in the conduct of the Gardner case since July 1st, 1869, and I have had no lawyer to defend or prosecute the defense or the appeal, nor has it been done on my account, otherwise than so far as may be held to result from the agreement of July 1st, 1869. After this compromise was effected, and as a matter of personal friendship to John A. Foster, and also to prevent the dentists from employing him against our then common interests, I did then get the Company to employ Mr. Foster as one of their lawyers, and he has told me from time to time that the Goodyear Dental Vulcanite Company has paid him since July 1st, 1869, for all services performed by him in the Gardner case; and, after the argument of that case, at Washington, before Judge Clifford, Mr. Foster told me that the Company had paid him two thousand two hundred or two thousand three hundred dollars for compiling that case; and I remember this distinctly, because Mr. Foster told me at the same time that he never would have got his money from the Company if he had not threatened "*to blow on the whole thing*,"—meaning, as I understood, to let the dentists know that it was a put-up job.

Some months after my compromise (Exhibit A) I was induced by the Company to go to Providence and get Mr. Hayes, whom I had originally retained for Dr. Gardner's defense, to assign the Gardner case over to Mr. Foster, or to Mr. Glassey, his partner. Mr. Hayes assigned the case, as directed by me, remarking to me, as he did so, that he had had a letter from Mr. Foster asking him to take a part in a collusive suit against Dr. Gardner. Mr. Hayes was very angry that Mr. Foster had dared to approach him with such a proposition, and he remarked that it was very well for Mr. Foster that he had not been present at the time he read his letter. All I know of Mr. Glassey's connection with the case is, that Mr. Foster told me he, Mr. Glassey, was to get five hundred dollars from the Rubber Company for arguing the Gardner case before Judge Clifford.

I remember that shortly after my compromise (Exhibit A), the lawyers who were conducting the case concluded to put in all the testimony for both sides, so that, should the collusive suit be discovered, the testimony would be so fairly put in that their complicity in the matter would not involve themselves; and further, that after the case was ready for argument, the dentists were to be informed of the fact, and induced to accept the case as then prepared, so that they might take part or not, as they chose.

J. B. NEWBROUGH.

[SEAL.] Subscribed and sworn to before me, this 26th day of October, A.D. 1872.

THOMAS L. CARPENTER,
Notary Public, in and for New York City and County.

[*Exhibit A.*]

This agreement, made and entered into this first day of July, A.D. 1869, by and between John B. Newbrough and Henry E. Fickett, of the City and County and State of New York, of the one part, and the Goodyear Dental Vulcanite Company, a corporation created under the laws of said State, of the other part: Witnesseth, Whereas, letters patent of the United States have heretofore been issued to the said John B. Newbrough and to one E. Fagan, as follows: No. 70,250, issued October 29th, 1867, No. 73,545, issued January 21st, 1868, No. 73,916, issued January 28th, 1868, No. 73,917, issued January 28th, 1868, all being for improvements in treating caoutchouc, gutta-percha, and similar gums, and in the manufacture of articles therefrom; and whereas, by assignment duly made and executed, the said Fagan has sold, assigned and transferred all his right, title and interest in and to said several letters patent, and the inventions described in and secured by such patents, to the said John B. Newbrough, of New York; and whereas, the said Goodyear Dental Vulcanite Company is desirous of terminating the litigation upon the question, whether the compositions in said letters patent described, and the material hereinafter mentioned, called oilite, are infringements upon the patents of Nelson Goodyear, owned by said company; and whereas, said Company, without in any way admitting the validity of said Newbrough and Fagan letters patent, or that the compositions therein described are not infringements as aforesaid, or that the material called oilite is not an infringement as aforesaid, have requested the said Newbrough to assign the said Newbrough and Fagan patents above mentioned, so far as they relate to, or are applicable for use in the manufacture of artificial plates, for dental purposes, unto Henry Redfield, of New York, in the State of New York.

Now this indenture witnesseth: That the said John B. Newbrough, for and in consideration of the sum of one dollar to him in hand paid, and of the covenants and agreements hereinafter contained, and to be performed by the said Goodyear Dental Vulcanite Company, has agreed to sell, assign and transfer, and has, by an instrument of even date herewith, sold, assigned and transferred to Henry Redfield, his heirs and assigns, the said several letters patent above mentioned, and the inventions described therein, so far as the same relate to, or are capable of being used for dental purposes, or for the manufacture of artificial plates or other structures for setting artificial teeth, or other uses connected with dentistry, but for no other use or purpose. To have and hold and enjoy the said patents and inventions for such uses and purposes, but not otherwise, during the existence of said letters patent, within the United States, as fully and entirely as the same could have been held and enjoyed by said Newbrough, had this sale and assignment not been made. And whereas, letters patent of the United States were, on the nineteenth day of January, A.D. 1869, issued to Robert Haering, numbered 85,997, for a "new mode for mounting artificial teeth," which said letters patent were, on the ——— day of ———, assigned to said Newbrough, who is now the owner thereof; which said letters patent are believed by said Company to be illegal and invalid, although this cannot be known with certainty until the question is settled by a judicial decision; it is therefore agreed, that if said last mentioned letters patent shall be decided to be legal, the said Newbrough shall, by a good and sufficient conveyance, convey and assign said letters patent and invention and all rights thereby created, to said Company or to such person as they may appoint or direct; such assignment, however, shall not take away or impair the rights of any person to whom said Newbrough has given licenses to use said Haering patent before this date.

And whereas, the object of said Company, in making this agreement, is that the dentists of the United States, who have infringed upon their patent rights, and have been prevented from taking or paying for licenses, to use the improvements and patent rights owned by said Company, under the Goodyear and Cummings patents, should cease from their infringements; and whereas, some of said dentists are refusing to take licenses from said Company, under the plea that they have licenses from said Newbrough to use either the Haering patents or to use the Newbrough and Fagan patents aforesaid, the said Newbrough therefore covenants and agrees, that he will, as soon as possible, do everything in his power to induce all the dentists who have licenses under either of said patents to give up their opposition to the rights of said Company, and take and pay for licenses therefrom of the form commonly used by said Company.

And the said Newbrough further agrees that he will do all that he can to prevent the Haering patents and the aforesaid Newbrough and Fagan patents from being any injury to the financial success or prosperity of said Company, and that he will not make or sell, or supply in any way, either directly or indirectly, iodized rubber, which can be used for dental purposes.

For and in consideration of such assignment or transfer, and of the said Newbrough covenants and agreements in this agreement contained, by him to be kept and performed, the said Goodyear Dental Vulcanite Company, for itself, its successors and assigns, covenants and agrees to pay to the said John B. Newbrough and Fickett, their heirs, executors, administrators, and assigns, twenty per cent. annually of the increased receipts which the said Goodyear Dental Vulcanite Company, its successors or assigns, may in any manner receive and derive from rights or licenses sold or granted to dentists, and damages and expenses, and cost of suits received from dentists and others, for the use of hardened rubber for dental purposes, during and for the term of four years from the date of this agreement; the receipts of said Company under its present organization, as a joint-stock Company, from the sale of such rights, licenses, damages, expenses, and costs, during the year prior to this agreement, from July 1st, A.D. 1868, to July 1st, A.D. 1869, as shown and determined by the books of said Company, under its present or previous organization, being hereby fixed and made the basis from which to determine such increased receipts before referred to; and from and after the expiration of said term of four years from the date of this agreement, to pay to the said Newbrough and Fickett, their heirs, executors, administrators, and assigns, ten per cent. of all such increased receipts, to be determined from the same basis as above specified; such proportion of such increased receipts to be due and payable so long as the said Company, its successors or assigns, shall continue to sell and grant licenses for dental purposes under the patents or inventions now held by said Company, or under the patents and inventions hereinbefore mentioned, and conveyed as aforesaid to said Company by said Newbrough; such per cent. or proportion of such increased receipts to be paid to said Newbrough and Fickett, their heirs, executors, administrators, or assigns, every quarter year, during the month succeeding each quarter year, from and after this date.

If, after the first year, the Company wish to change the quarter days of making accounts and payments, to conform to their annual settlements of their books, they shall be at liberty to do so, always giving to said Newbrough and Fickett their proportion of receipts, estimated as aforesaid.

Said Goodyear Dental Vulcanite Company, for itself, its successors and assigns, further covenant and agree to keep full and accurate books of account, of all grants and licenses, which may be made or granted by it or them for the use of hardened or other gum for dental purposes, and of any and all receipts which may be had or derived therefrom; which books of account shall be open to the inspection of said Newbrough and Fickett, or their representatives, at all reasonable times; and to render the said Newbrough and Fickett, or their representatives, during the month of July in each year, or during any other month in each year which may be fixed for the annual settlements as aforesaid, a statement showing in the aggregate the receipts so received or derived during the past term of twelve months; and to pay to them, the said Newbrough and Fickett, or their representatives, at the time of rendering said statement, the per cent. or proportion then due, if any, under and by virtue of the terms of this agreement.

And whereas, the said Newbrough has invented a new process for making a material similar to hardened rubber, and capable of being used in place thereof for dental purposes, but which material does not contain or make use of India-rubber, gutta-percha, or similar gums, or any gums allied to gutta-percha or India-rubber, or any gums capable of vulcanization, and which process and material has not been patented, and is a secret with him, said Newbrough, and which material is called oilite; the said Newbrough covenants and agrees not to manufacture such new material, except for his own office use, as a dentist, and not to impart the knowledge of such process or material to other dentists during the continuance of this agreement, and the performance of the conditions thereof by the parties thereto.

Said Newbrough covenants and agrees with said Company, that he will not make, nor allow said oilite material to be made, of any color which can be used for dental purposes, or for the use of any dentists excepting himself; that he will not make oilite of any color, for any persons, excepting for those who will agree not to use or sell it, or give it to be used, for dental purposes, in any way; and that he will so protect and regulate the manufacture, and sale and use of said material, that dentists shall not, in any form or manner, directly or indirectly, have the use of it for dental purposes.

And the said Newbrough further covenants and agrees, that in case the manufacture or use of said material can be made the subject of letters patent, he will take out letters patent for the same, and will give the exclusive right to use the same to said Company, and its assigns, so far as its application for dental purposes or in dentistry is concerned.

The said Newbrough covenants with said Company, its successors and assigns, that he will do all he can to promote the interests of the Company; that if he has made already, or shall make, during the continuance of this contract, any improvements or inventions in the manufacture of dental plates, he will communicate and assign all such improvements and inventions, or patents or patent rights, for the use of improvements of any kind, in relation to the manufacture of dental plates, he will assign the same to said Company.

And the said Newbrough agrees, that he will, during the continuance of this contract, do all he can to protect said Company in the use and profitable enjoyment of their patent rights; that he will not in any way, directly or indirectly, do, or cause to be done, anything to prevent their sale of rights or licenses under any of their patents, or to prevent their collection of royalties or license fees for the use of their patents; that he will not, directly or indirectly, sell or give, to dentists or to other persons, for them, any substance for dental plates of any kind, except made under the patents of said Company, or in any way assist in the manufacture or sale of any such substance for dental purposes in any form, unless for his own use, in his own office, other than above mentioned.

If, through the neglect or design of the said Newbrough and Fickett, the secret of making oilite shall become known to dentists, or used by them in dentistry, then the said Newbrough and Fickett shall no longer be entitled to receive this proportion of the receipts of said Company under this agreement.

And in consideration of the premises, and of said assignment and transfer as aforesaid of said patents before mentioned, the said Company, for itself, its successors and assigns, further covenants and agrees, to give and grant, to such persons as may be designated or nominated by Mr. Henry E. Fickett, five (5) dental licenses, to make and use hardened rubber, gutta-percha and similar gums, for dental purposes; such licenses to be granted, or renewed, so long as said Company, its successors or assigns, shall continue to grant similar licenses to others; provided, however, that such licenses shall be issued by said Company for the same length of time as similar licenses are granted to others, and shall be renewed from time to time, as other licenses; and shall be conditioned for the payment of the same royalties or license fees as other similar licenses issued by said Company;

but, as to such said five licenses, the said Company, for itself, its successors and assigns, agrees, in consideration of this agreement, and of services rendered and to be rendered by said Fickett, to repay or refund to the said Fickett the amount of the royalties or patent fees due under, or that may be conditioned to be paid by, such several licenses.

The said Company further agrees, with said Newbrough and Fickett, to constitute and appoint the said Henry E. Fickett as their agent to collect, within the States of New York, Pennsylvania, New Jersey and Ohio, the royalties or license fees due and payable under any licenses which have been or may be granted by said Company within the said several States, and to pay to said Fickett, for his said services, the same compensation other agents receive for similar services, to be under the direction of the Treasurer of the Company.

And said Fickett agrees, in all respects, to be a faithful agent, and do all he can for their interests while in their employ, and in all respects to conform to the instructions of said Company. The said Company, for itself, its successors and assigns, and the said Newbrough and Fickett, for themselves and their legal representatives, mutually covenant and agree with each other to perform and carry out, honestly and in good faith, the several conditions and provisions contained in this agreement, and in case either party shall neglect or fail to perform any part thereof, the other party shall give written notice to him or them of such neglect or failure.

If there is a difference of opinion between the parties as to their respective rights or duties, or as to the proper construction of this agreement, the question shall be submitted to arbitration, or it shall be submitted, in the form of an amicable suit, to some court of competent jurisdiction to decide between them; and in case of refusal to perform this agreement after the rights are so determined, or of refusal in case there is no difference of opinion, then, in case the refusal should be on the part of said Company, the said Newbrough shall have the right to manufacture and sell to others the said material of oilite, or the process of making the same, with the same rights and privileges in respect thereto as if this agreement had never been made; and in case the refusal shall be on the part of said Newbrough and Fickett, the said Company shall be released from making any further payments to said Newbrough or Fickett, and said Fickett shall no longer be their agent or receive any compensation as such.

Each party shall have the right to all legal measures, and to obtain redress in all usual forms of law, for any breach of covenant herein contained.

It is agreed that the suits now pending between the Company and said Newbrough shall be disposed of as follows:

The suit upon the patent of Nelson Goodyear, in which the question of the infringement by the use of iodized rubber is raised, shall be dismissed without prejudice or costs to either party.

In the suit against said Newbrough for infringing the Cummings patent, a final judgment for the complainant shall be entered with nominal damages. The suit for the repeal, or setting aside of the Haering patent, shall be left to the Court for their decision, whether the Haering patent is legal and valid or not.

It is also understood and agreed that the subjoined affidavit, regarding the composition of the material called oilite, is made a part of and one of the conditions of this contract.

The licensees named by said H. E. Fickett, and made a part of this contract of settlement, are: John B. Newbrough, of New York, Edward Fagan, of New York, Edwin Heald, of Brooklyn, B. E. Gardner, of Providence, and Alex. B. Halliwell, of Cleveland, Ohio.

In case of the death of any of these parties no other is to take the place; but of the persons here named no sum of license fee shall be demanded which shall exceed in amount the sum accredited to each during the continuance of the patents.

(Signed)

J. B. NEWBROUGH, [L. S.]
HENRY E. FICKETT, [L. S.]
JOHN H. CHEEVER, [L. S.]
Pres. G. D. V. Co.
JOSIAH BACON, [L. S.]
Treas. G. D. V. Co.
GOODYEAR DENTAL VULCANITE CO. [L. S.]
By JOHN H. CHEEVER, *President.*

Witnesses, CHARLES E. HILL,
JOHN L. COBB.

UNITED STATES SUPREME COURT.

No. 133. December Term, 1871.

BENONI E. GARDNER, *Appellant*, *vs.* THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.	*On motion to dismiss appeal.*

United States of America, Southern District of New York:

Henry E. Fickett, having been duly affirmed, deposes and says: My name is Henry E. Fickett; age, fifty-three years; I reside in Brooklyn, N. Y., and am a builder. Prior to the 1st day of July, 1869, and at that time, I had been, and was, engaged and connected with Dr. J. B. Newbrough's interest under patents held by him for improvements in treating caoutchouc, gutta-percha, and similar gums, and in the manufacture of articles therefrom. I had aided in introducing his patented compounds to the notice of the dental profession, and in granting the licenses under his patent to manufacture artificial plates or bases for artificial teeth.

Before July, 1869, Dr. Newbrough had become involved in litigation with the Goodyear Dental Vulcanite Company, who sued him for alleged infringements of patents held by the Company, and they sued one of his licensees at Providence, R. I., Benoni E. Gardner. It seemed to me, from the course of those controversies, desirable and expedient for the interests of both parties—Dr. Newbrough and the Company—that they should adjust amicably all the questions in dispute, and I exerted myself in that behalf, to such effect that, on the 1st day of July, 1869, in conformity with negotiations previously had to that end, a compromise was effected and embodied in a written agreement executed under that date by and between J. B. Newbrough and myself of one part, and the Goodyear Dental Vulcanite Company of the other part,—John H. Cheever, President, and Josiah Bacon, Treasurer, of the Company, executing it in the Company's behalf. I have examined the original duplicate annexed to the affidavit of Dr. Newbrough under the same caption as this affidavit (and of this date, and marked Exhibit "A," Thomas L. Carpenter, Notary Public, N. Y. City and County), and identify the same as one of the two (duplicate writings) executed as aforesaid. All questions between Dr. Newbrough and the

Company were concluded by that compromise, and thenceforward their interest was one and the same in accordance with the provisions of that agreement. The suits were dismissed or disposed of as provided for in the agreement, and the license was granted to Dr. Gardner as therein provided.

Up to this time, Mr. John A. Foster was one of Dr. Newbrough's counsel against the Company; but after the compromise, immediately thereafter, Mr. Foster became the counsel of the Company. I do not recall the exact time, but in the latter part of the year 1869 I went to Mr. Foster, at the request of Mr. Cheever, the President of the Goodyear Dental Vulcanite Company, and paid him, as a retaining fee for the Company, five hundred dollars. About the same time and also at the request of Mr. Cheever and for the Goodyear Dental Vulcanite Company, I paid Mr. S. J. Glassey five hundred and sixty-seven dollars as his fee to go to Washington and argue before Judge Clifford on the part of Benoni E. Gardner, but in the interest of the Goodyear Dental Vulcanite Company, the case as made up and presented under the title of the Goodyear Dental Vulcanite Company against Benoni E. Gardner, in the Circuit Court of the United States for the District of Rhode Island.

From the date of the compromise, my intercourse with Mr. Foster and with Mr. Glassey was in my capacity under the agreement and with them as counsel for the Company. Some months after the agreement was consummated, Mr. Foster presented to me, as agent under the agreement, a bill for his services in all the suits which were settled by the agreement. The amount of this bill was two thousand two hundred and fifty dollars, or thereabouts, and I took it to Mr. Cheever as President of the Company, and went twice after it. Foster threatened if Cheever did not pay he would write to the Judges and expose the whole matter. Cheever afterwards told me that Bacon had paid the bill, and Foster told me it was paid. It was paid some time in the spring or summer of 1870, or thereabouts. The payments made to Mr. Foster and Mr. Glassey by myself were reimbursed to me by Mr. Cheever, the President of the Company. After the settlement of July 1, 1869, it was arranged among the counsel of the Company that a case should be concocted and taken to the Supreme Court for their benefit, and that was done under the title of this Gardner Suit in Rhode Island. To my knowledge there was no adverse interest in that suit, because there was only one party engaged in it. The provisions of the agreement of July 1, 1869, as to the interest of Dr. Newbrough and myself in the enhanced receipts of the Goodyear Dental Vulcanite Company, were carried out, and payments on account thereof made to us from time to time for about one year after the date of the agreement, when the interest—the pecuniary interest—of both of us was purchased by the Company, so that the Company alone controlled the whole matter, and my agency for the Company terminated.

II. E. FICKETT.

[SEAL.] Subscribed and affirmed to, this
26th day of October, A.D. 1872.
THOMAS L. CARPENTER,
Notary Public, in and for New York City and County.

SUPREME COURT OF THE UNITED STATES.

No. 133. December Term, 1871.

BENONI E. GARDNER,
vs.
THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.
} *On motion to dismiss appeal.*

United States of America, Eastern District of Pennsylvania, ss.:

Henry Coy, having been duly sworn, deposes and says: My name is Henry Coy; age forty-seven. I reside in Camden, N. J., and do business in the City of Philadelphia, Pa., as a manufacturer. In December, 1870, I was requested by Dr. Samuel S. White to join him with his legal counsel in the consideration of a proposal that he should engage in the sale of an article called "Ready Rubber."

Mr. Henry E. Fickett, of New York City, and William D. Ludlow, who accompanied him, represented the Ready Rubber Company and opened the negotiation. These were afterwards joined by John A. Foster, Esq., of New York City, as their legal counsel. We had an evening session at the house of Dr. White's counsel, in Philadelphia. During the interview, all sitting around the library table, the conversation was mainly between the two legal gentlemen, but heard by all.

In the course of his remarks Mr. Foster referred to an appeal having been taken in the case of Gardner to the Supreme Court. This was previously unknown to either Dr. White, his counsel, or myself, and was questioned. Mr. Foster then plainly said that Gardner had appealed, and that the case was a collusive one, made up expressly to obtain a decision by the Supreme Court of the United States in favor of the Cummings patent. He spoke also of his connection with the case as the reason of his positive knowledge and ability to make these assertions.

On the next day we met at Dr. White's office at Chestnut and Twelfth Streets, Philadelphia, the same parties being present except the legal counsel of Dr. White, who had been obliged by other engagements to leave the city; and I, being dissatisfied about the appeal, questioned Mr. Foster directly concerning it. I had but a short time before read the paper book of the case on final hearing in the Circuit Court, and knew the decision, but regarding it as only a question of whether Iodized Rubber could win a special exemption by reason of being a different compound from that named by John A. Cummings in his specification, I did not consider the case as having the force and gravity which Mr. Foster claimed for it. Besides, I wished to learn why—as Mr. Foster asserted—the owners of the Cummings patent were anxious to have a case appealed after they had gained it.

Mr. Foster then explained that the Goodyear Dental Vulcanite Company had by their settlement with Dr. Newbrough obtained control of the defense of the suit against Dr. B. E. Gardner, and had managed by stipulations between counsel to put into that case all the points which were favorable to them in the Wetherby and other suits, so that with the least possible risk to their patent, and thus safely and cheaply, they might obtain a decision in their favor on all important points in the court of last resort. Mr. Foster was extremely free in his denunciation of the make-up of this case—used the words "collusive," and "both sides made up by the plaintiff"—and, I think, spoke freely by name of the counsel of the Bacon party who had shaped and managed the case. He said also, that the settlement of Dr. Newbrough had been for a time concealed from him in order to secure his continuance as counsel for the defense. This was said in reply to my inquiry as to how he would stand as being engaged in such a collusion as he described. Mr. Foster was not only explicit in statement, but was also careful to argue from this circumstantial statement of the case that by reason of the skill in the preparation thereof in this collusive manner, the Cummings patent was certain to be affirmed, as good, by the Supreme Court, and there was only one way open by which dentists could escape from the unjust and onerous taxation of the owners of it—and that way was by using Ready Rubber; his object in these interviews being, as counsel for the Ready Rubber parties, to induce Dr. White to adopt and introduce to the profession that compound as a base for artificial teeth.

HENRY COY.

Subscribed and sworn to before me,
this 26th day of October, A.D. 1872.

ORLANDO G. HEMPSTEAD,
Notary Public.

[The motion and affidavits having been filed, the following notification was forwarded to the several parties and their counsel :]

UNITED STATES SUPREME COURT.

No. 133. December Term, 1871.

BENONI E. GARDNER, *Appellant*,
vs.
THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.
} *On motion to dismiss appeal.*

WASHINGTON, *October 29th*, 1872.

TO THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON, NO. 5 TEMPLE PLACE, BOSTON, MASS., NO. 38 PARK ROW, NEW YORK CITY, N.Y.

The within is a copy of motion filed by us in open court this morning. Regularly, the hearing and argument would take place on Friday next; but if you desire to contest our right to have the judgment stricken out, and the cause dismissed for the reasons set forth, you will be entitled to such reasonable postponement as you may need for the purpose of making your answer. You will oblige us by making your wishes known, as soon as you conveniently can, to

J. S. BLACK, *York, Pa.*
HENRY BALDWIN, JR.,
No. 522 *Walnut Street, Philadelphia, Pa.*

[Early in January the following notice was served by the Company's counsel :]

UNITED STATES SUPREME COURT.

No. 133. December Term, 1871.

BENONI E. GARDNER, *Appellant*,
vs.
THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.
} *On motion to dismiss appeal.*

And now come the appellees above named, defendants to the said motion, and move the Court to order that all testimony in relation to the matters charged in the said motion be taken by oral examination and cross-examination of witnesses in writing, and that the cause be referred to ——— ———, of the city of New York, as special Examiner for this purpose.

CAUSTEN BROWNE, *of Counsel.*

[By a subsequent notice the above motion was assigned for hearing on Friday, January 17th, 1873, when the following document was filed in support of the above motion for an Examiner :]

SUPREME COURT OF THE UNITED STATES.

No. 133, of December Term, 1871.

BENONI E. GARDNER, *Appellant,* *vs.* THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.	*On motion to dismiss appeal.*

And now this ——— day of ———, A.D. 1873, come before the court the said Goodyear Dental Vulcanite Company and Josiah Bacon, who is the Treasurer and principal business agent of the said Company, and who answers as well for it as for himself, and in answer to the said motion and the allegations of fact made therein, say as follows:

1. They deny that there was no dispute between the plaintiffs and the defendants in the court below, at the time the final decree was there made, and on the contrary aver that the relief prayed in the bill of complaint was at that time in actual controversy between the parties, as expressed in their pleadings.

2. They deny that there was no dispute between the appellant and the appellees in this court at the time this appeal was taken, or when it was argued, and on the contrary aver that the relief granted in the decree of the court below was, at the time of taking such appeal, in actual controversy between the parties as expressed in said appeal, and further, that the said appeal, after the same was taken, was actively promoted down to and including the argument thereof, and the expense of the argument thereof was in part paid by the said Samuel S. White, on behalf of whom, among others, this motion to dismiss is made, and that with full knowledge of all the facts hereinafter stated.

3. They deny that the decree for damages or for costs against the defendant in the court below was not or is not intended to be enforced, and they deny that the appellant ever was or is now protected against the same or any part thereof, by any agreement in that behalf, by the appellees before or after said decree was taken.

4. They deny that the injunction granted by the court below in its final decree was not or is not intended to be enforced, and they deny that the appellant was or has ever been protected against the same by any license granted in that behalf by the appellees at any time.

5. They admit that the appellant is not liable for costs in this court,

because they did promise him after his appeal had been taken that they would not hold him so liable.

6. They deny that the appellant here has no interest in the questions involved in this appeal, and on the contrary aver that he is interested herein to this extent, that the decree herein, if it shall finally stand affirmed in this court, can and will be enforced against him, save only as regards costs in this court. They admit that they are attempting, and, as they believe, lawfully attempting, to procure the opinion of this court, in so far as the attempt to sustain the said decree involves procuring the opinion of the court upon questions of law, in the decision of which their interest is opposed to that of other persons, including the said Samuel S. White, who are not parties to this suit, to wit, dentists desiring to use the said Cummings invention, in regard to whose knowledge of it, while pending in the Circuit Court, they are not informed and cannot say further than this, that the pendency of the suit in the Circuit Court was, they believe, very generally known to the dentists throughout the country—being at the time a prominent topic of discussion in dental publications—and was of their knowledge known to the said White.

7. They deny that this cause was argued in the court below or in this court without there being any interest adverse to the appellees represented therein, or any real or substantial controversy between them and the appellant, or any conflict between their interests; and on the contrary, they aver, as they have before averred, that at the time of the argument in the court below, and also at the time of the argument in this court, the said Gardner, defendant therein, was interested adversely to the appellees, and there then existed in the cause a real and substantial controversy and conflict of interests between the appellees and the said Gardner; and also that at the time of the argument of the cause in this court there was represented therein adversely to the appellees, besides the interest of the said Gardner, the interest of a large number of other dentists using or desiring to use the said Cummings invention, including, as they believe, those in whose behalf this motion is made, and particularly including the said Samuel S. White, which dentists, with full knowledge of the facts hereinafter stated, directly intervened in aid of this appeal, and urged the said Gardner to persist therein, expressly upon the ground that they desired to have such their own adverse interest represented and protected therein, and promised the said Gardner to pay the expenses of the argument thereof, and did, accordingly, employ at their own charge the counsel who argued the cause in this court.

8. They deny that the Goodyear Dental Vulcanite Company was ever in the court below or in this court the sole party in interest in this cause, or *dominus litis* on both sides thereof.

9. They deny that, while this cause was pending in the court below, the appellees became, or that they have ever been, the legal or equitable owners of all or any opposing interest involved therein. They admit that the fees of counsel for services rendered to the defendant in the court below, from and after the execution of the contract (Exhibit A, annexed to the affidavit of John B. Newbrough, filed with this motion, viz., July 12th, 1869), were paid by them in pursuance of an agreement made at the time of executing said contract, and as part of the consideration thereof moving from them. That this agreement to pay counsel fees was made with the said Newbrough, who had been, up to that time, defending this suit at his own expense, being one of the owners of certain patents for a peculiar sort of hard rubber which he had licensed the said Gardner to use in the making of the dental plates complained of in this suit; and that the said counsel fees, as earned, were charged by the counsel to the said Newbrough with his knowledge and consent, and the account, when made up, rendered to him, and payment of the amount thereof by the Goodyear Dental Vulcanite Company procured by him. That this agreement to pay counsel fees was made by the Goodyear Dental Vulcanite Company, because the said Newbrough was unwilling to incur any more expense himself in defending this suit against said Gardner, and the said Company knew that the said Gardner was neither willing nor able to himself pay, for the benefit mainly of other infringing dentists, such large expenses as the further defense of the suit would necessarily involve; and it was very desirable to them, the said Company, that the question of the validity of the said Cummings patent should not be delayed in coming to the decision of this court, as would have happened had the said Gardner, for want of means, refused to go further with the defense. That their said agreement to pay the charges of his counsel was known and assented to by the said Gardner. That no instructions or requests were made by them or for them, directly or indirectly, to the counsel who thereafter, as they had been doing previously, conducted the said defense, in regard to the conduct thereof, except that they would make the said defense as strong as they could, and would not unnecessarily delay the proofs and the advance of the cause to hearing; and they deny that they made up a record therein to suit themselves. They deny that they interfered in any way with, or did anything to impair, or modify, or at all direct, the course of the said defense. They deny, on information and belief, that there was any evidence, documentary or other, beneficial to the defense, which was not put into the case on behalf of the defense and brought before the court for consideration.

These several denials they make not only so far as their own conduct was concerned, but upon information from their counsel so far as their counsel's conduct was concerned, and upon such information and belief, and upon their own knowledge, they aver that all the defenses raised, or which could, with any prospect of advantage to the defendants, have been raised in the pleadings, were fully and fairly presented in the record of the cause.

GOODYEAR DENTAL VULCANITE COMPANY,
By JOSIAH BACON, *Treasurer.*
JOSIAH BACON.

CAUSTEN BROWNE, *of Counsel for Defendants.*
C. F. BLAKE, *of Counsel* (by C. H. HILL).

United States of America, District of Massachusetts :

On this 18th day of January, 1873, personally appeared JOSIAH BACON, named in and who signs the foregoing answer, and, being duly sworn, says that the statements therein made are true.

Before me,
[SEAL.] GEO. P. WHEELER,
Notary Public.

True copy.
[SEAL.] Test.: D. W. MIDDLETON,
Clerk Supreme Court U. S.

[Mr. BLAKE, on behalf of the Company, having submitted the motion for an Examiner, Mr. BALDWIN, in reply, read and asked leave to file the following paper in opposition to the motion:]

SUPREME COURT OF THE UNITED STATES.

No. 133. December Term, 1871.

BENONI E. GARDNER, *Appellant,* *vs.* THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.	*Motion to dismiss appeal.*

May it please the Court:

The undersigned, as well as their clients, have always felt the anxiety, which was natural and proper, that this motion, involving, as it does, the reputation of several persons heretofore regarded as respectable, should be decided according to the pure truth.

If, therefore, the Goodyear Dental Vulcanite Company and its officers, attorneys, and counsel had come into court and specifically denied, on their oaths, the facts set forth in the affidavits filed by us, we were ready to join with them in a commission to be appointed by the court, or agreed upon by ourselves, for the purpose of taking the testimony.

Instead of that, we find them using the forms of equity pleading, as if our motion were a bill of review, and making their denials so general that, if sworn to, it would be difficult to convict them of perjury even if we proved every fact sworn to in the affidavits.

We insist upon it that, until the specific facts set forth in the affidavits filed by us shall be denied by the parties accused, upon their oaths, the court is bound to regard their silence as an admission of their guilt.

These specific facts are:

1. That the suit, after answer filed, was entirely and fully compromised between the parties, so that the defendant, Benoni E. Gardner, had no manner of interest in any result to which it could come, and so that Newbrough, who, up to that time, had been defending it for Gardner, had not any interest whatever in opposition to that of the plaintiffs below.

This is proved by the affidavits of Newbrough and Gardner themselves, and also by the affidavit of Fickett, and by the agreement of July 1st, 1869, annexed to Newbrough's affidavit.

2. That the counsel who, after that time, pretended to be carrying on the case for the defendant was, in fact and in truth, the counsel for the plaintiffs,—acted for them, supported their interest, and was paid by them.

The facts are proved by the affidavits of Gardner, Newbrough, and Fickett.

These proofs not only show the fact that such were the relations of the parties, but that Mr. Foster, the counsel employed, was entirely conscious that it was a "a put-up job."

3. It was not only so arranged as to leave the defendant and apellant, Gardner, without any actual interest in the pretended controversy, but it was expressly stipulated with him that he should not be responsible for costs, so as to leave him no inducement to expose the sham.

These facts are proved by the affidavit of Gardner himself.

4. It is proved by the affidavit of Fickett that the plaintiffs below employed and paid Mr. Glassey to argue nominally in behalf of the defendant, Gardner, but actually in the interest of the plaintiff, the Goodyear Dental Vulcanite Company, the pretended issues discussed under this pretext before Mr. Justice Clifford on the simulated final hearing of the case below, and, acting in pursuance of this agreement between him and the plaintiff, and earning the reward paid to him for the iniquity, he did come to Washington, and, pretending to be counsel for the defendant, argued the case before Judge Clifford in the interests of the other side, winning it for his real clients and losing it for the party he pretended to stand up for.

5. The appeal was taken by Mr. Holmes, acting as agent or attorney of Josiah Bacon, Treasurer of the Goodyear Dental Vulcanite Company, who induced Gardner to sign it by false pretenses and the promise that he should be protected against costs or other liability, and who got another person entirely unknown to Gardner, the defendant, to sign the bond as surety.

The facts appear from the affidavit of Gardner himself.

6. The cause was finally argued in this court on the part of the defendant by the counsel of the plaintiffs with the money of the plaintiffs in his pocket.

7. The record was arranged by agreements and stipulations between the counsel openly acting for the plaintiffs and other counsel paid by the plaintiffs, but pretending to act for the defendant, and thus the case was not only fraudulently argued but fraudulently made up.

All these facts are fully and accurately set forth in the affidavits. We have endeavored to conceal nothing from them, but to give them the fullest notice of the position in which the truth, or what we supposed to be the truth, would place them.

If they do not deny upon their oaths that the affidavits are true, it is surely the duty of the court to do in this case what has been done in all other similar cases heretofore—that is, to take it for granted that a specific denial is withheld because it cannot safely be made.

We maintain our right to insist upon this course, not from any desire to deal harshly with the parties accused, but because we fear that it is intended to lengthen out and protract this inquiry and to postpone a final hearing so that it may not be disposed of at the present term.

Our desire to give them a fair and full chance to answer in a way worthy of innocent men, if they are innocent, has been taken advantage of for seventy-five days, and has ended at last in this artificial and uncandid and irresponsible statement.

We therefore ask the court to fix an early day for the hearing of our motion upon the affidavits and proofs now before them.

(Signed) J. S. BLACK,
HENRY BALDWIN, Jr.

Philadelphia, January 16th, 1873.

True copy.
[seal.] Test.: D. W. Middleton,
Clerk Supreme Court U. S.

The Chief Justice gave leave to file the papers, and reserved the motion for advisement.

Mr. Justice Bradley suggested that the answer should be sworn to, and signed by counsel.

[WE have procured the following report of what transpired after the motion for an Examiner was heard by the Court.

The Court did not appoint an Examiner, but issued a rule that the respondents should show cause on Friday, January 24 (the next motion day), why, upon the facts then before them, the appeal should not be dismissed, intimating that they did not desire to hear any further argument in support of the motion to dismiss; and under this rule Mr. Browne and Mr. Blake appeared as counsel for the Company.]

SUPREME COURT OF THE UNITED STATES.

No. 133. December Term, 1871.

BENONI E. GARDNER, *Appellant*, *vs.* THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.	*On motion to dismiss appeal.*

JANUARY 24, 1873.

Mr. Browne. May it please your honors, I shall not detain you long I understand that your honors desire the counsel who represent the respondents to this motion to be heard upon the question why, upon the facts stated in the ninth clause of their answer to this motion, the appeal should not be dismissed.

Permit me, your honors, to state a few facts preliminary to what I wish to say, if anything, directly upon this motion. The answer which your honors have before you, and to which I have just referred, was drawn up by myself in Boston, I having been, as almost all of your honors know, of counsel in the case with Judge Curtis in the court below and in this court, and it was drawn up by me after an investigation in regard to the charge made,—an investigation made under the same sense of duty to which Judge Curtis refers in his letter to Mr. Blake, which has been placed upon the files of the court, in which he says he thought it a duty which he owed to the court and to himself to assist me in the investigation of the alleged facts, which were previously wholly unknown to him, and he has no doubt to me also. I trust it is not necessary for me to assure the court that I was as ignorant as Judge Curtis of whatever facts alleged here have attracted the attention of the court as making a case of impropriety. That is enough for that.

I am aware that no such issue is made here this morning, but I take the earliest opportunity to make that statement to your honors. The answer was drawn up after investigation conducted by myself, with occasional conferences with Judge Curtis, running through many weeks. When at last they were completed, the answer was drawn, which was submitted to Judge Curtis, a few amendments made, and it was then drawn up for execution and advised by Judge Curtis, in concurrence with my opinion, as a proper paper to be filed.

It was signed by the Company, not sworn, because it was in answer to a paper unsworn, to wit, the motion; and it would have been, I suppose, an impertinence to have made a sworn reply to an unsworn paper.

The paper was sent to Mr. Blake, who kindly agreed to present the motion which we made up for an order that the witnesses in support of the motion be produced for examination and cross-examination, and our witnesses also.

He was here last Friday. I received a telegraphic dispatch on that night that your honors desired to have the answer not signed by the defendants but sworn to by the defendants, and also signed by counsel. I proceeded to have that done. Judge Curtis had left town the day before for Washington. I was unable to procure his signature to the answer with my own, which I should have desired to do, nor had I then any reason to doubt that I should have obtained it if I had asked it.

I received late on Tuesday night a telegraphic dispatch that your honors desired to hear the defendants upon the question that I stated a little while ago. I received my dispatch Tuesday, too late to leave that evening. I left Boston the next night, and after traveling two nights I arrived this morning, and have had a conference with Judge Curtis,—the first one I have been able to have, your honors will see, since the case assumed its present position. I learn from Judge Curtis what surprises me, but of course I should never differ from him in regard to a matter of that kind. I learn from him that he did not mean me to understand that he proposed to appear in support of that answer, or in any way to appear as counsel in the case. I was all along aware that it was his intention, and I had partly formed the same intention myself, that if this cause should come to a hearing on the facts in which my own statement, as well as Judge Curtis, would be involved, propriety would require him, as well as myself, to stand out of the argument. I see no impropriety myself in my arguing, any more than I do in Judge Curtis arguing, the question of law, whether or not the facts stated in the ninth clause of this answer constitute an objection to the maintenance of a suit either in this or any other United States court.

There are other considerations, however,—considerations of duty to the Goodyear Dental Vulcanite Company,—which strongly disincline me, and have also disinclined my brother, Mr. Blake, to engage in the argument of such an important matter: important not only as a question of law, and of precedent, but important in its bearing upon the characters of gentlemen,—upon such notice as I have received, or in view of Judge Curtis's retirement from the case at this point,—to take the responsibility of such a question.

I therefore, may it please your honors, come before you this morning, not——

The Chief Justice. Mr. Browne, we had no intention of making you proceed unless you chose. We simply notified counsel that we would hear argument, if it suited them.

Mr. Browne. I understood that the order was a peremptory one.

The Chief Justice. Not at all. You can name any time you choose.

Mr. Justice Bradley. Perhaps another observation might be made in reference to some remarks which have fallen from Mr. Browne. The court has not intended to express itself at all as condemning the propriety of counsel's presenting the paper, but simply whether, upon the statements contained in it, they have anything to say whether the decree should not be opened.

Mr. Browne. Now, may I inquire, without being irregular, whether, when this question comes to be argued, whoever the counsel may be that the Company shall select to present it to your honors, it will be open to that counsel to argue the force of the ninth clause in the light of the rest of the answer? In other words, whether we shall take the whole answer together in submitting to the court the effect of the ninth clause, or whether we shall be prohibited from looking outside of its language?

The Chief Justice. Not at all. You are perfectly at liberty to refer to the whole answer.

Mr. Browne. Now, may it please your honors, we shall be indebted to the court for an opportunity of delaying, which his honor the Chief Justice kindly suggests we may have; but before I sit down let me say now that I would not have your honors think, when it comes to be said by counsel by and by, that it was an after-thought for the purpose of delaying, with which purpose we have been freely charged, and most unjustly. And let me say this—we shall urge, or at least I shall advise, that whoever presents the case to your honors will urge that, although your honors should be quite clearly of the opinion, or strongly inclined to believe, that as a matter of law, conceding the most perfect purity of intention on the part of everybody, and the most perfect good faith towards the court on the part of counsel,—which I take always for granted,—that, assuming that the admissions in this ninth clause ought, as a matter of precedent, to be fatal to the decree:

Then I shall advise that it be urged upon your honors that inasmuch as that question of just precedent will be as well open to the court to pass upon and decide by and by, at the end of the investigation of the facts, that your honors ought to allow the investigation of the facts to proceed, and let the whole case come up together. I simply now want, as I say, to deprecate any suspicion that it is an afterthought for delay. I bring it forward now, and it will be upon this ground: that no private statements of counsel can take the place of the demonstration, which we have not the least doubt will be afforded your honors, if the witnesses can be examined and cross-examined, of the utter groundlessness of the charges which have been made here.

The Chief Justice stated that the court was unanimous in the opinion that no outside testimony was desirable. He said that counsel had made a statement which counsel on the other side had answered. As to the statements against Mr. Browne, he required that the present impression of the court as to the admission should be removed, and gave him the option of next Friday, or the succeeding Friday, on which to present the case.

Mr. Browne. We will give your honors notice of the earliest day when we can proceed.

The Chief Justice. Will you name your own day?

Mr. Browne. Perhaps we cannot name it at this moment, but when we have had an opportunity to confer, we will acquaint the clerk of the court.

The Chief Justice. Very well. That will do.

Mr. Blake. I merely wish to explain that one of the counsel on the other side has engagements with myself next Friday, which will cover the Friday after to-day, and therefore we are unable at present to designate a day.

The Chief Justice. We do not expect to hear the other side at all.

Mr. Blake. Then it is whenever we choose to come here?

The Chief Justice. Yes. Whenever you choose to come.

Mr. Justice Bradley. If you do not satisfy our minds then, we may think it necessary to order an investigation. If you do satisfy our minds then, we shall probably not think it necessary to order an investigation.

SUPREME COURT OF THE UNITED STATES.

No. 133. December Term, 1871.

BENONI E. GARDNER, *Appellant,* *vs.* THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON.	*On motion to dismiss appeal.*

FEBRUARY 7, 1873.

On the assembling of the court, Mr. Causten Browne said:

May it please your honors, I shall need to detain the court but a very few minutes, and I shall take it as a great favor to be allowed to say what I wish to say now.

Your honors will remember that when I was here two weeks ago, being then, as I stated, a good deal taken by surprise at the necessity I was under of representing the matter of the Gardner appeal to your honors alone, I asked and obtained by the courtesy of the court such time as might be required to enable me to confer with Mr. Blake and with the Goodyear Dental Vulcanite Company in regard to the course which might be proper: whether the matter of the dismissal of the appeal should be argued at all, or, if it should be argued, by whom it should be argued.

Your honors, as I understood you, were kind enough to say then that we might present the matter to the court on the following Friday, or the Friday after that, which is to-day.

Directly upon leaving Washington, viz., on the following Monday, Mr. Blake and myself held the desired consultation, and came to our own conclusion as to what should be done; and drew up then, on the date which it bears, the paper which I have here, and which I shall ask leave to read to the court.

The step we proposed, however, was one so important to the Company, that we deemed it proper they should have the opportunity of allowing it, or disallowing it, by their vote. It was impossible, as it turned out, that a Directors' meeting should be held earlier than Tuesday last. It was then held, consent was given, and I have come here, deeming it proper out of respect to the court as well as ourselves that I should appear in person.

I mention these facts because, from having been notified in the meantime that we should be peremptorily required to present the matter either this Friday or next Friday, I feared that an impression existed in the minds of the court that there was some disposition to defer our action.

With your honors' leave I read a very brief paper, which comprises all that we desire to say.

(Mr. Browne then read the following:)

"SUPREME COURT OF THE UNITED STATES.

No. 133. December Term, 1871.

"Benoni E. Gardner, *Appellant,*
vs.
"The Goodyear Dental Vulcanite
"Company and Josiah Bacon.
On motion to dismiss appeal.

"The counsel who signed the answer to this motion made a most careful and conscientious examination of the facts before the answer was drawn. They believed then, and they believe now, that the statements contained in it are exactly true, and that they are susceptible of the amplest proof.

"They now learn that the fact stated in ninth clause of the answer, that during the latter part of the preparation and the argument of the cause the counsel for the defendant were paid by the complainant, seems to the court of itself sufficient ground for the dismissal of the appeal.

"It was the opinion of the counsel in submitting their answer, that if the integrity, fair dealing, complete preparation of the defense, and the entire absence of collusion, were made to appear in proof, as alleged in said ninth clause, the motion to dismiss the appeal should be denied, notwithstanding the payment of counsel which the court seems to disapprove. But they think that the question presented is not one which they ought to argue. It is a question of propriety and good practice. Upon such a question, whatever may be their own opinion, they do not think it becoming in them as officers of this court to advise it. It is enough for them to know that the court doubts.

"Under such circumstances, while they deeply regret that by this disposition of the case the refutation upon the record of the charges made against counsel will become impossible, they do not think it proper to contest with the court the dismissal of the appeal.

"They therefore waive the fact that this motion is promoted by the same persons who, with full knowledge of all the facts, aided in promoting the appeal, and the further fact that the appeal was determined at a term of the court now passed, and with full confidence that when a cause based on the same patent comes here again, the integrity of the present record will be completely vindicated. They submit the question of dismissal to the judgment of the court without argument.

"NEW YORK, January 25, 1873.

"CAUSTEN BROWNE.
"CHAS. F. BLAKE.

"True copy.
[SEAL.] "Test.: D. W. MIDDLETON,
"*Clerk Supreme Court U. S.*"

I beg leave of the court to place this paper upon the files.

[The paper was then filed with the clerk.]

[The final conclusion of the matter will be found in the decision, which was rendered Monday, March 3, 1873.]

SUPREME COURT OF THE UNITED STATES.

No. 133. December Term, 1871.

Benoni E. Gardner, *Appellant*, *vs.* The Goodyear Dental Vulcanite Company, *et al.*	*Appeal from the Circuit Court of the United States for the District of Rhode Island.*

On Motion.

Mr. Chief Justice Chase delivered the opinion of the court.

The original suit in equity was brought by the Goodyear Dental Vulcanite Company against Gardner to enjoin him from the use of certain patented subjects belonging, as alleged, to the Company, and for an account. The case was heard upon a bill, answer, and testimony, and there was a decree in favor of the Company in the Circuit Court for the District of Rhode Island, in September, 1870. Upon appeal to this court the decree below was affirmed on the 6th of May, 1872, but the opinion has not been read. The defense was conducted by counsel originally employed and paid by Newbrough, under whom Gardner was licensee. On the 1st of July, 1869, before the decree in the Circuit Court, Newbrough and the Company compromised all matters of difference between them, with the understanding that this suit should go on to the final hearing and determination both in the Circuit Court and in this court on appeal, as if the compromise had not been made.

The Company, however, paid the counsel employed for the defense as well as for themselves in Circuit Court, and subsequently in this court. These facts appear from the record and from the admissions of the Company in the ninth article of their answer to the motion to dismiss the appeal. They are the only facts which we think it necessary to notice.

It may be that the Company has not become the legal or equitable owners of the opposing interests involved in the suit. There may be, and doubtless are, large opposing interests of which they are neither the legal nor equitable owners. *But it cannot be admitted that one* *party to a suit can pay the fees of counsel on both sides, both in the court below and on appeal, without being held to have such control over both the preparation and argument of the cause as to make the suit merely collusive in both courts.* It can make no difference that the counsel fees were charged to the party apparently though not really liable to pay them, and payment from the other party procured through him. *This, indeed, is a circumstance against the party who pays the fees rather than in his favor.*

The motion to vacate the decree of affirmance heretofore made, and to dismiss the appeal, must, therefore, be granted, and an order made to recall the mandate which has been issued to the Circuit Court. We take occasion, however, to say that we see nothing in the conduct of the counsel who actually represented the Company which merits blame, or which ought to affect in any degree the high esteem in which they have been held. Neither of them appears to have had any knowledge of any arrangements made by their client with the opposing party.

True copy.

[SEAL.] Test.: D. W. MIDDLETON,
Clerk Supreme Court U. S.

[That there may be no question as to the scope and effect of the foregoing decision, we have procured and append a copy of the mandate which *had been issued* to the Circuit Court, and which is *recalled* and *annulled* by the decree on the motion to dismiss the appeal.]

UNITED STATES OF AMERICA, ss.

THE PRESIDENT OF THE UNITED STATES OF AMERICA,

To the Honorable the Judges of the Circuit Court of the United States for the District of Rhode Island, greeting:

Whereas, lately, in the Circuit Court of the United States for the District of Rhode Island, before you, or some of you, in a cause between The Goodyear Dental Vulcanite Company and Josiah Bacon, complainants, and Benoni E. Gardner, respondent, wherein the decree of the said Circuit Court entered in said cause on the 8th day of September, A.D. 1870, is in the following words, viz.:

"Upon the coming in of the master's report, and on motion of the complainants' counsel, it is ordered and decreed by the Court that the said report be confirmed and established, and that the said defendant, Benoni E. Gardner, and his agents and servants, be perpetually enjoined from making, using, or vending to others to be used, any one or more dentures or plates for artificial teeth manufactured according to the process described in the reissue patent, in said bill of complaint mentioned.

"And the Court doth further order and decree that the said defendant do forthwith pay unto the complainants the sum of seventy-five dollars, being the amount of profit found by the said master's report to have been received by the said defendant, Gardner, from the manufacture and sale of plates for artificial teeth manufactured according to the process described in the said reissue patent, in violation of the exclusive right of the complainants.

"And the Court doth further order and decree that the said defendant, Gardner, do pay to the said complainants the costs of this suit, taxed at two hundred and forty-eight dollars and eighty-four cents ($248.84), entered as the decree of this Court, per order thereof, this 8th day of September, A.D. 1870."

As by the inspection of the transcript of the record of the said Circuit Court, which was brought into the Supreme Court of the United States by virtue of an appeal, agreeably to the act of Congress, in such case made and provided, fully and at large appears.

And whereas, in the present term of December, in the year of our Lord one thousand eight hundred and seventy-one, the said cause came on to be heard before the said Supreme Court, on the said transcript of the record, and was argued by counsel: On consideration whereof, it is now here ordered, adjudged, and decreed by this Court that the decree of the said Circuit Court in this cause be and the same is hereby affirmed, with costs and interest until paid, at the same rate per annum that similar decrees bear in the courts of the State of Rhode Island, and that the said complainants recover against the said respondent, Benoni E. Gardner, three hundred and ninety-nine dollars and nineteen cents for their costs herein expended, and have execution therefor.

6th May, 1872.

You, therefore, are hereby commanded that such execution and proceedings be had in said cause, as according to right and justice, and the laws of the United States, ought to be had, the said appeal notwithstanding.

Witness the Honorable Salmon P. Chase, Chief Justice of said Supreme Court, the first Monday of December, in the year of our Lord one thousand eight hundred and seventy-one.

Costs of Complainants:

Clerk	$379.19
Attorney . . .	20.00
	$399.19

Taxed by D. W. Middleton,
C. S. C. U. S.

SUPREME COURT U. S. DECEMBER TERM, 1871.

Costs of the Goodyear Dental Vulcanite Company *et al.*, in No. 133, 1870:

$379.19; Fee book L; pa. 378; Test.: D. W. Middleton,
C. S. C. U. S.

1872, May 14. Received payment, per A. Pollok, Esq.
D. W. Middleton,
C. S. C. U. S.

THE BENONI E. GARDNER APPEAL CASE

IN THE

SUPREME COURT OF THE UNITED STATES.

> **"The evidence in a suit, where only one party is heard, is straighter than a line."**
>
> *Hindu Proverb.*

In the June number of the Dental Cosmos we endeavored correctly to exhibit the procession of events and the persons concerned in the decision obtained in the above case in the Supreme Court. We quote the conclusion of that article:

> "What all this brings us to is the present relation of dentists to vulcanite work and the patent which controls it. The Goodyear patent expired May 6th, 1872. On that day this decision was announced, which gives to the Cummings patent a standing in court which deprives individual dentists of any hopeful chance of resisting it.
>
> "There is naturally due to a decision of the Supreme Court of the United States a certain weight and effect which this one will fail to secure permanently. We charge that the parties by whom this case has been made up have committed a deliberate contempt upon this highest tribunal of our country; that they purchased this case, so as to control it; that since its purchase, they have directed both sides of it, for the express purpose of gaining a decision rapidly and safely. Reckless of the dignity of the courts through which they have worked; reckless of the interests of thousands of dentists whom they plotted to entrap in meshes from which they now represent that there can be no escape; reckless of the professional honor of their own ablest advocate; reckless of everything but the success of their plans, and their selfish greed for a harvest of plunder.
>
> "We charge that in this case, since the settlement of the Goodyear Dental Vulcanite Company with John B. Newbrough, July, 1869, there has been no veritable *plaintiff*, because they were bound by that settlement to *give* a full license to the man whom they are, in this suit, pretending to sue for infringement. There has been no veritable *defendant*, because B. E. Gardner was licensed, and protection for him secured in Newbrough's contract.
>
> "We charge that this case has, ever since July, 1869, been collusive, and that it is a fraud upon the courts, and upon those against whom this decision is now sought to be enforced, and has never had any color of verity, except that which it obtained through the misguided efforts of those dentists who aided in giving it that semblance by their action just previous to and at the hearing.

"Such a decision—a decision so obtained—is not entitled to, and will never receive, the deference and respect of intelligent, law-abiding, and equity-loving citizens.

"The proofs of collusion and fraud, which we have gathered and hold, are safe beyond the possibility of concealment or purchase. They are ready to aid whatever resistant action the dentists of the United States may decide upon or be advised to take; whether that shall be to seek a rehearing of this badly-prepared case, or to claim a fair hearing on a new one.

"Be sure, that when presented, the Court will listen to them, and that this decree of May 6th, 1872, will NOT be FINAL. We advise our friends not to believe it, not to submit to it, nor to think of it as FINAL. Dentists should cease the use of rubber, and refuse to take or pay for licenses. Half-way measures will not do now. The refusal must be absolute, and it must be general. Let us test the question whether there is in this great body of educated men enough self-denial to make this course a success.

"If this feeling and determination is established in the minds of individuals, it will be communicated from one to the other, extend to local meetings and conventions, and become accepted and recorded as the decision of these primaries.

"Out of these a league may be formed, and a national organization set up, which will exert an influence strong enough to draw in the wavering, and those who have calculated upon making profit out of the abnegation of their brethren.

"Ultimately, with a careful selection of leaders, wise forethought, the best and ablest counsel in all the land, and the abundant means which a very small contribution of a host of members will aggregate, this Goodyear Dental Vulcanite Company shall suffer first the extinction of their revenue, and then a trial, which will extinguish the title of their Cummings patent."

Convinced of the truth of the foregoing charges, and seeing how much oppression by fraud might be perpetrated under this decree of the Supreme Court, we thought it our duty to inform the Court of the facts, and procure a rescission of its decree, and thus save the profession from the necessity of passing under the yoke prepared for them.

Accordingly, we sought the advice and aid of counsel, who, upon examination of the case, assured us that the law could not thus be evaded and prostituted by corrupt men. In the interest of the dental profession not parties to the suit, but whose rights might be seriously affected, we caused the facts to be laid before the Supreme Court of the United States, and asked that the decree should be stricken out and the appeal dismissed, on the ground of the collusion and fraud before mentioned. The Court saw how it had been imposed upon, and granted our prayer.

The fact that the Company in question resorted to foul play shows that they themselves were conscious of having a bad hand; otherwise they would not have relied upon "ways that were dark" and tricks that turned out to be vain.

We have given a full copy of the record of the proceedings on our motion, to verify our statement, and to show that what we charged *before* this motion was made has been proven. To the mind of a candid reader, we think the record exhibits in a most unenviable position the parties concerned; but if it furnishes any ground for charity, we give them the benefit of it.

This decree, in which Mr. Justice Clifford himself concurs, negatives, neutralizes, and nullifies the effect of the decree of the Circuit Court of Rhode Island, supersedes the impending affirmance of that decree by the Supreme Court, and thus obviates the difficulties which would otherwise have been in the way of any subsequent or further endeavors by the profession to obtain a hearing upon the real merits of the case.

It is sufficient to say that all questions that have been, or are, or may be, material or relevant in connection with the Cummings Patent, and the rights of the profession in view of that patent, are now and thus open and free for discussion by and in behalf of the profession, for establishment by proof, for argument by counsel, and for adjudication by the courts.

Of our own course in connection with this appeal, the action of the Supreme Court of the United States is sufficient explanation and vindication, correcting as it must all misapprehension, neutralizing all misrepresentation, and showing in the light of a complete triumph to what interest our efforts were devoted, and with what effect. Working alone, and assuming the sole and entire responsibility, we resorted to the only means left available to foil the well-planned scheme of that appeal, by laying before the Court, immediately upon the opening of the adjourned term, the facts which have led them to the decision that now takes the place of the affirmance that would otherwise have been promulgated. *This affirmance, once promulgated, would have rendered it virtually impracticable to reinstate the profession in the advantageous position which it now occupies. The proceeding itself, and its result, are without precedent in the history of the Supreme Court.* Never before has there been a case in which an appeal was fully argued, a decision made, a decree affirmed, and the affirmatory mandate issued, and then the decree of affirmance vacated, the opinion withheld, the appeal dismissed, and the mandate recalled, upon the ground that the suit, both below and above, was "MERELY COLLUSIVE."

SAMUEL S. WHITE.

THE

DENTAL COSMOS.

VOL. XV. PHILADELPHIA, MAY, 1873. No. 5.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S., in the Office of the Librarian of Congress at Washington.]

(Continued from page 119.)

HAVING now completed the second year of dental development, we usually find in position the complete set of deciduous teeth. These are twenty in number,—two central incisors, two lateral incisors, two cuspids, two first molars, and two second molars in each jaw. These teeth are almost always very evenly placed, very prettily shaped, and white and cleanly in appearance, thus enabling almost every parent to comment upon the beauty of *their* children's teeth; but even this condition of things is sometimes deviated from, and the deviation assumes every degree of gradation, from the mere line of greenish hue upon the exterior face of the teeth at the margin of the gums, which tarnishes the spotless purity that has existed until the fourth or fifth year, to the almost immediate appearance of extensive and decided dark-green or blackish-brown deposit, which takes away all comeliness, and is not unfrequently associated with that corroding process known as dental caries, by which, with greater or less rapidity, the whole of the crowns of the teeth are destroyed, thus introducing, even during the earliest child-life, experiences of the entire range of dental pathology, from sensitive dentine to necrosis of the teeth. Fortunately, when this condition exists, it usually expends the greater amount of force upon the superior incisors and canines, which in children are, of course, from position, the most easily cleaned and taken care of by the parents, and which the little ones soon learn to avoid during mastication, for which purpose they still have decidedly the most useful teeth, the molars.

It would seem, to the superficial observer, that it would now be in place to speak of the diseases and treatment of the deciduous teeth, but I feel sure that a little reflection will suggest that the only distinctions which can pertain to the operations and applications for the prevention or relief of the dental troubles of childhood, in contradistinction to those of later years, are such as are entailed by purely physiological considerations, and, as it is presupposed that a reader of dental pathology is necessarily acquainted with dental physiology, upon the common-sense basis that no one could be made conversant with the correction of pathological deviations unless he possessed a knowledge of physiological proprieties, it will readily be admitted that the only plan of instruction in this direction is to mention such distinctions in place, in connection with remarks upon the various pathological conditions pertaining to adult teeth, and refer incidentally to such physiological considerations as point to therapeutic variations. I shall therefore, for the present, pass over such conditions as will frequently demand attention from the dentist, in the mouths of children between the ages of three years and five years, and, at this time, only discuss such pathological conditions as pertain strictly to the removal of the deciduous teeth, and the placing in position of those teeth which are to be their successors, and which are known as the

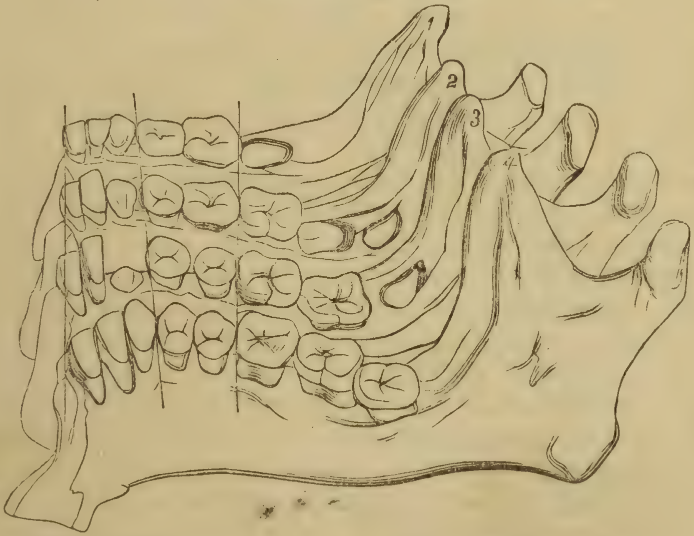
Second Set or Permanent Teeth.

It is normal that at about the completion of the fifth year of life a marked enlargement of the gums, both superior and inferior, should take place posterior to the second molars of the deciduous teeth, indicative of the approaching eruption of the first molars of the permanent teeth. These are regarded as the *six-year-old* teeth, and are usually fully erupted during the sixth year; the deviations from this are quite infrequent, though these teeth are sometimes completely in position during the fifth year, and are sometimes not completely erupted before the child is nearly seven years old,—very rarely there are still greater deviations from normal than even these, but I have never known any peculiar interest or importance to attach to even the greatest deviations except that they are apt, though not invariably, to pertain to dwarfs or giants, thus measurably indicating general abnormality.

The first molars of the permanent teeth are almost always erupted with very little inconvenience to the child, and even less to the parent,—so much so, that they are frequently cut without the knowledge of the latter, and, as a consequence, are thought, when noticed, to belong to the deciduous or "first set" of teeth; these teeth seldom require lancing, though it is true that in extreme cases this operation is sometimes resorted to for relief: ordinarily, concomitant with the eruption of these teeth there is some soreness of the gum noticed by the child during mastication, which is guarded against by almost involuntarily moving the food to some other position in the mouth, and sometimes tenderness of the second temporary molars is observed when the attempt is made to chew hard food, which is also equally involuntarily provided for, by instinctive avoidance of such for a short period of time. From these facts, it becomes additionally incumbent upon the dentist to know, and to educate the parents among his patients in the knowledge, that very important teeth are thus quietly placed in position; teeth that will be found to be the outposts, guarding the territory within which all the great dental changes for the next half-dozen years are to take place; teeth which may indeed be regarded almost in the light of key-stones for the future dental arches.

DIAGRAM.

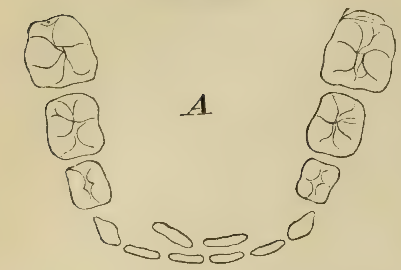
Four Jaws, showing Position of First Permanent Molars between the Ages of Six and Twenty Years.



Jaw 1. Five years.
" 2. Six to seven years.
Jaw 3. Twelve years.
" 4. Eighteen to twenty years.

It will be seen, by referring to the diagram, which is corrected from Hunter's "Natural History of the Human Teeth," edition of 1771, Plate XVI., Fig. 2, that decided as are the changes in size and number of the teeth, as well as in size of the jaws, that occur between the ages of six years and twenty years, the first permanent molar occupies a position which is, so far as regards the mesial lines, or symphyses of the jaws, *practically* (not absolutely) always the same. Thus it is that in supervising the process of the removal, by nature, of the deciduous teeth ("shedding") and their replacement by the permanent organs, practice should always be based upon this knowledge, together with the recollection of the relative difference in size of the various teeth pertaining to each set; therefore, when at the age of about *seven* years the deciduous lower central incisors begin to loosen, after having, together with the other anterior deciduous teeth, become somewhat separated as the jaw enlarges a little in development, and the permanent inferior central incisors (one or both) present beneath and *behind* them, and are found to far exceed in width their predecessors, the deciduous teeth *should not be extracted*, but, decidedly otherwise, should be left until they are completely exfoliated or actually annoy by exceeding looseness, when they may be taken away without the infliction of any pain to the patient.* In the event of some soreness presenting prior to this degree of looseness, it can easily be allayed by the application of some one of the several gentle anodynes which pertain to the dental materia medica, such as laudanum, camphor, arnica, or phénol sodique.

Diagram A.



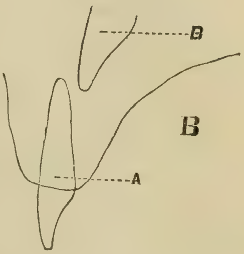
It sometimes happens that the *inferior* centrals do not present thus physiologically, but are discovered with the cutting edge peeping out of the gum *in front of the deciduous centrals ;* when this is the case it becomes advisable *at once to extract* the deciduous central or centrals, as one or both of the permanent teeth are found coming thus irregularly,—*never both* deciduous centrals *unnecessarily*, as sometimes one of the permanent teeth will present exteriorly and the other interiorly, and never, under such circumstances, either deciduous lateral, until it has been in due time proven that the nearly developed permanent central cannot be guided by ligatures or otherwise into the arch, *even in an oblique position.* It must be remembered that the permanent centrals are wider than the deciduous centrals, and that they cannot therefore be expected as yet to take their position regularly as regards alignment; this is a thing which is dependent upon time,—*quite a long time,*—and it is very important that the many natural dental evolutions which require so much time for their proper performance should not, except in very infrequent cases, be interfered with, and never by the operation of extraction, unless such is clearly indicated to a judgment which is founded upon thorough physiological knowledge in this connection. It is easy to extract, but it is impossible to replace teeth when extraction has been proven detrimental.

---

* My usual method of extracting a deciduous tooth is to cover it with the end of a napkin, and thus precluding slipping, remove it with the thumb and finger. I have several hundreds of children patients, and from the entire number have removed but nine deciduous teeth in the past five years.

It is usually next in order that the superior central incisors should erupt, and it is therefore considered normal that these teeth should present some time during the *seventh* year, somewhat later than the inferior centrals; the eruption of the superior centrals is ordinarily preceded by marked protuberances upon the gums, above and exterior to the deciduous centrals and laterals; when this is the case it is proper that no interference should be indulged in, but that the progress of dentition should be occasionally viewed to assure the practitioner of continued normality. The simplest deviation from normal presentation of superior centrals, is when their cutting edges have position a little inside of the *apices* of the roots of the deciduous centrals, and point outwardly; and even this form of presentation entails no necessity for any operation so long as the pulps and peridental membranes of the deciduous teeth retain their vitality; for, as has been intimated when upon dental development, so long as vitality remains, an attempt, more or less successful, is made, through every tissue, to accomplish all the varied phases of growth, anticipatory and progressive; and thus it is that we find the removal of the roots of the deciduous teeth being accomplished sufficiently in advance of the progress of the growth of the permanent teeth to preclude any encroachment upon the part of the latter. When, however, as is sometimes the case, the vitality of any root or roots of the deciduous incisors has become impaired, as the result of loss of vitality of the pulp (from caries or local medicinal application), or from the greater complication of subsequent suppuration (alveolar abscess), or from injury done by violence (as a blow), or from excessive mercurialization, or from purely systemic influence (marked struma), then we find the absorption of the deciduous root precluded, and as a consequence it forms an obstacle to the advancement of the crown of the permanent tooth, which obstacle is removed mechanically by this organ, and is thus pushed outward and forward until the apex of the root of the deciduous tooth actually protrudes from the gum at a point near the reflection of the mucous membrane, and commences a laceration of the lip, which, in one instance, I have seen continued to perforation. Even in these cases it is not usually advisable to extract the deciduous tooth unless it is quite loose, but, permitting the crown of such tooth to remain for the double purpose of maintaining the full size of the alveolar ridge, as well as offering some aid to the further spreading of the coming permanent teeth, the end of the necrosed root should be cut off, using for this purpose sufficiently strong scissors or excising forceps, and any roughness remaining after excision should be carefully

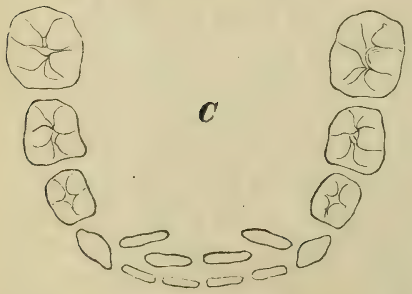
DIAGRAM B.



smoothed by means of a file. But deviation from the proper direction on the part of superior centrals is sometimes even greater than this, and they are noticed either erupted or endeavoring to erupt *behind the deciduous incisors.* This forms a relatively analogous condition to that of the eruption of the inferior centrals *in front* of the lower deciduous teeth, and, if seen sufficiently early, demands immediate effort for its correction, by the extraction of the deciduous centrals, and the direction to the patient to press the coming teeth outward as much as possible with the thumb; indeed, to advocate the induction of that ordinarily bad habit, "sucking the thumb," as this tends at once to press the lower teeth in and the upper teeth out; I have again and again been exceedingly gratified at the satisfactory results produced by this easy method of employing most available apparatus in the correction of really quite serious cases of this kind; and the objectionable habit inculcated is easily broken up in a few days by the application to the thumb, of capsicum or aloes, or even the employment, for a short time, of a glove-finger as a "cote."

At about the *eighth* year the inferior permanent lateral incisors should be coming into view, and it will be seen, upon examining a physiological preparation of the jaws, at six or seven years of age, that these teeth are decidedly behind the permanent centrals; this relative position should be maintained until after eruption, and it is therefore normal that these teeth should appear even farther in the mouth than the centrals, and still more than these behind the deciduous teeth. If, as sometimes occurs, all four of the inferior permanent incisors are erupted before any of the deciduous teeth are shed, we then have the most positive assurance possible that the little patient will eventually have a permanent denture of regular alignment, as the extraction of two teeth, possibly loose (the centrals), and two more, not perceptibly loose (the laterals), and even two more, absolutely firm in the jaw (the cuspids), would not necessarily entail much deformity; thus we see that even wholesale extraction at the hands of intolerable ignorance cannot inflict much damage provided "nature" has succeeded in obtaining this much advantage. But even in these instances I regard *any extraction as entirely unnecessary,* and most decidedly prefer awaiting patiently the further efforts of nature, which finally result in excessive looseness of the deciduous teeth, probably their complete exfoliation, or, at least, their perfectly easy removal, and thus

DIAGRAM C.



give all possible time for the accomplishment of such other progressive steps in dentition as will certainly secure a regular permanent denture. If the inferior permanent laterals appear *anteriorly to the deciduous* laterals, these latter should be at once extracted, and, if necessary, when the permanents are sufficiently erupted for the attachment of ligatures, these should be applied, and the teeth drawn within the circle of the upper arch, *using very gentle traction*, in which position they will naturally be maintained by the superior central incisors. *The cuspids should never at this time be extracted*, for reasons which will be given in place.

(To be continued.)

ALVEOLAR CYSTS.

(A Thesis presented to the Faculty of the Philadelphia Dental College for the degree of Doctor of Dental Surgery.)

BY JOSEPH MACHWUERTH, D.D.S., PALATINA, BAVARIA.

Dr. Stephani, while making a section of the superior maxilla, which he had removed from the body of a male of about fifty years of age, discovered a dental cyst within the alveolar process. It is in this circumstance that the ensuing observations had their origin. Dr. Stephani permitted me to study the specimen. I am indebted to Dr. George von Langsdorff for assistance given me while pursuing the microscopical research. Having the results of these observations with me at the time when it was necessary for me to prepare a thesis, I have ventured to present them in that shape to the honorable faculty.

Cysts of the jaw are held by O. Weber to be due to errors in the development of the teeth. R. Volkmann attributes them to diseased teeth, particularly to their roots. Others, as Rokitansky, refer these cysts to normally existing spaces, or to new formations. A third group of writers, as Tourdain and others, do not accept the cyst in any shape, but credit the cavities so called to abscesses and fistulæ. They would describe the walls of the "cyst" as being defined by the periosteum, or, to speak more in accordance with the views of many, by the alveolo-dental membrane. This view agrees with those entertained by Weber and Volkmann above mentioned. Yet other authors, as Rokitansky, Forget, and others, in their classifications, assign the locality according to the places of origin. Thus Albrecht (Deutsche Vierteljahrsschrift für Zahnheilkunde) makes two main divisions of the cyst, viz., the superficial and the deep-seated.

Of the *first* or *superficial*, he says that they lie upon the labial side of the bicuspid tooth, and are more frequent in the upper than the lower jaw.

I cannot believe that the pressure of the tongue and the orbicularis oris muscle can be said to prevent the appearance of the cyst upon the inner part of the mouth, when the size that a ranula may attain in spite of such pressure is remembered. The author has seen numerous instances of the cyst following minute abscesses, the position of which could scarcely be foretold. For the origin of the abscesses themselves, he would let the yellow color, the blood-vessels, and the corpuscular character of the contents speak for themselves. That such an abscess is not followed by necrosis is due to the exclusion from contact with pus which the bony walls of the sac everywhere enjoy through the periosteum,—which here acts as a sort of pyogenic membrane,—as well as by reason of the very gradual process by which the periosteum becomes detached from the bone. The sac-membrane consists of nuclei and a net-work of fibers. Albrecht found the contents to be made up of corpuscles, fat, and large cells with granular contents "of a fatty nature,"—in a word, of degenerated pus corpuscles with their associated extravasated fluid. Should a communication exist between a cyst and the maxillary sinus, it (the cyst) does not undergo change,—nor does it run out by a mere opening made into its wall. Its deep position protects it from pressure,—as the ingress and egress of air also tends to restrain the escape of its contents (?). The cyst must necessarily have a limited area, owing, in a minor degree only, to the pressure of the muscles without, but mainly to the consistence of the bone itself. Of the second or *deep cyst*, we find the most examples in the lower jaw. The teeth in the neighborhood are generally loosened, and abscesses are found as complications of those teeth which are the most carious. Albrecht divides the deep cysts into those which are composed of a follicular neoplasm, and those composed of follicles already present. (For a case belonging to this group, see Heider, Vierteljahrsschrift, ii., 5.)

Now we may conveniently divide alveolar cysts into the *false* and *true*, as indeed would appear from the above to be already indicated. The *false* or *pseudo cysts* (sacs) take their origin as a complication of abscess, and present two varieties: those lying superficial to the bone, and those placed within it. The *true* cysts are not necessarily associated with an inflammatory process. They arise from three localities, viz., from mucous follicles upon the bone, from follicular structures within it, and from the primitive teeth follicles themselves.

In the Deutsche Vierteljahrsschrift (vol. i., p. 1) is a treatise by C. Wedl and M. Heider, wherein are enumerated examples of true cysts containing small quantities of fluid, the walls of which, according to Rokitansky, are composed of epithelial elements. They are found occupying a normally present cavity, or constitute a neoplasm which fills up the interstices of the bone, and are mutually compressed. Upon the whole, they are rarely seen, though I believe that they are more frequent than is generally supposed, since they doubtless often escape notice. Albrecht found, out of nine thousand three hundred and fifty cases, seven instances of such cysts. They always present sharply-defined borders, with yellowish albuminoid contents of the consistency of jelly. The walls are smooth, rather thick, and are distinct from the surrounding bone. They are oftener seen in the upper jaw than elsewhere, and here most frequently above and behind the bicuspid teeth. Their origin is obscure. At first they grow slowly, without pain or sensation of fullness. After having attained some size, they grow more rapidly and press aside the neighboring tissues. It is in this stage that they ordinarily are presented for treatment. The bony coverings are now so thinned as to resemble parchment, and can be readily depressed. Indeed, the walls may be perforated by the growth, and in the event of the antrum being involved, the cyst may eventually extend in that direction. Six cysts peculiar in this regard have been described (*ibid*). They were situated behind the right superior central incisor tooth.

We are informed by Dr. Henry Hancock (Der Zahnarzt, x., No. 3) that Bordenaave, Dupuytren, and Stanley refer alveolar cysts to the pre-existence of dental caries. The author, however, would rather agree with Fergusson and O'Shaughnessy, in entirely excluding this as a cause, and in attributing them, as is doubtless more rational, to caries and necrosis of the bones. In like manner he refers to a distinct group the cysts of the maxillary sinus, which, as is known, are not bounded by osseous walls. The occasional complication of hypertrophy of the parietal and occipital bones would still further disprove any essential connection with a purely local source of irritation. The classification of tumors proposed by Hancock is essentially that of Ormerodan, which is based upon studies of preparations found in the various museums. In this arrangement the tumors are grouped in the order of their frequency. Thus, first, *epulis;* second, cysts,—*i.e.* tumors in the shape of closed sacs with more or less non-puriform contents. The walls are thin and translucent, and the sac filled with a whitish fluid, with a more firm, corpusculated stroma, or filled with a granulated jelly-like substance which is supported by fibrous trabeculæ. They may consist also of a single osseous cyst, which is covered by a membrane, and occupied by an albuminous fluid.

In his work upon the morbid tumors, Virchow (17th Lecture, p. 57) divides the tumors of the jaws into the odontomata and the osteotomata. It is apparent that the odontomata must be associated with the period of development of the teeth, since they are seen to arise from dentine, and this tissue is developed from the mucous layer of the dental sac; so that the odontome at one period must necessarily have presented itself as a hypertrophy of the mucous tissue, consequently as a myxome. He further says that occasionally the myxoma persist, without passing to the condition of dentine. It is a question whether we may not here include many of the so-called epulides. Indeed, Robin has shown that certain *fibrous* tumors of the jaw are of this origin.

On page 69 Virchow treats of the so-called alveolar exostosis, and is inclined to accord it a secondary position. In a word, all the changes which grow in the bone about the cysts are limited either to the periosteum or the medulla. When these are involved, the entire jaw is swollen, and subsequently becomes thinned and indurated. It is worthy of remark that an osteoporotic condition of the bone is most frequently seen about the site of old cysts. From this circumstance our author insists upon the distinction between the true alveolar cyst and those which are filled with a fluid or jelly-like contents which are found at the roots of the teeth. In the last case there is often found in certain localities a swollen condition of the bone, often an entire side is engorged, the soft parts mainly involved, thickened, and consolidated. Under it is the varying thickness of the bone, which at times incloses a rather extensive cavity. In this cavity lies the retained tooth, for the most part surrounded by pus and granulations. The particular conditions of each case naturally determine the individual differences; and I would here remark that, in the majority of cases, the cysts present no very great varieties of form, and when the retained tooth is in a normal position, a slight disturbance of the surrounding tissues is alone seen. The tumor generally presents a smooth contour, especially when the root of the tooth is exostosed, or the bone eburnated or hypertrophied.

Besides retention, dislocation of teeth, particularly those in the upper jaw, may exist. These may protrude even into the maxillary sinus. Such tumors can, of course, occur at any portion of the jaw.

In a memoir, entitled "Contributions to Dental Surgery," by Dr. Kleinmann (see Zahnarzt, xxi., No. 13), the author says that he is enabled to distinguish the alveolar cysts more by their location in the jaws than by the alveolated character of their contents. With regard to the nature indicated by this cystic formation, he maintains that this is for the most part of a serous character, and, at least in the upper jaw, single. He therefore proposes for them the name of *cysta serosa.*

The *cause* of alveolar cyst is yet obscure. According to Rokitansky, the cyst is developed from a nucleus which is evolved from an elementary body by a process analogous to intussusception. According to Brücke, the true cysts arise both from normal and abnormal processes; either as a result of an exudated fluid, containing serum, blood, and pus elements associated with an alveated stroma; or through the aid of coagulable elements of extravasation, which in time become thickened by a true hypertrophic process, or by repeated attacks of inflammation. The contents of the cyst, therefore, according to this author, are primary,—the cyst, the wall, is secondary. Förster assures us, in his "Pathological Anatomy," that "cystic tumors in the highest type of their development are vesicles whose contents have an independent origin." He further denominates the cystic formation as resulting from exudation and extravasation. "The serous exudation," says he, "presses the cellular portions from one another; it consists of a cyst-like space, which gradually contains a fibrous capsule, and finally an envelope of squamous epithelium. The growth of the cyst is not constant,—the serous and colloid cysts grow through new formations, while the walls, likewise, become more bulky." Kleinmann maintains that in most cases a diseased root is the cause of the alveolar cyst, since it is difficult, when the teeth are known to be perfectly sound, to attribute a chronic periostitis entirely to external influence.

In a clinical lecture "Upon Tumors of the Jaws" (Zahnarzt, x.), by James Syme, five cases are narrated in which three had teeth firmly fixed in their sockets, and two had the teeth loosened by disease. They had serous or puriform contents. They were independent of other diseased action, yet he found here and there an irregular position of a permanent tooth. In one instance a tooth formed a portion of the contents of the cyst. Such formations occur later in their growth, and may secure lodgment deep within the bone, though ordinarily they are destroyed by treatment at an early stage. Syme has observed multiple cysts with albuminous contents. The pus-containing tumors originate generally from a root of a tooth.

Dr. Gosselin, of the Cochin Hospital of Paris, narrating "A Clinical Lecture upon the Cysts of the Lower Jaw" (Zahnarzt), uses the following language: "These cysts often contain a serous fluid, often thick, blood-stained, or glairy. They may contain pus or jelly-like mass, hydatids, or teeth. Sometimes they have a fibrous stroma. Their position is for the most part upon the lateral part of the base, and develops therefrom throughout the bone. In one case the fibrous mass within was united to the wall of the cyst yet more intimately. The etiology is obscure. The patients are for the most part young and vigorous."

The *symptoms* of alveolar cyst are: persistency; a dull pain, becoming more or less acute when the vascular turgescence from pressure is marked (under which circumstances a small even swelling is seen, which gradually and steadily advances), or in the event of involvement of the dental nerves. These latter, according to Forget, are generally preserved intact. The cyst in time becoming larger, the osseous walls become expanded and thinned, and are easily depressed from without. The teeth about the swelling become loosened, and may be lost. With the growth of the affection the pain increases; there is difficulty in mastication and speech, as well as respiration, in consequence of possible pressure exerted upon the tongue. No matter how large the tumor may become, the skin always remains of a normal color; is never varicose or uneven as in carcinoma. Its course is slow. In the absence of crepitation, how can we distinguish the disease from its congeners? Exostosis (osteosarcoma) may in this event resemble it. On the other hand, we should remember the regular, rounded form, slow development, normal skin, absence of lancinating pains, swellings of the glands of lower jaw, and varicose veins upon the tumor.

Leblank (Zahnartz, v.) describes an interesting specimen of a bone or tooth-cyst in the jaw of a horse. An osteosarcomatous tumor of the lower jaw was situated between the incisors and molar teeth, which were pushed from one another. In the centre of the growth was found a distinct portion of osseous tissue; upon the base of the cavity was seen a well-defined surface, which was placed toward the inner lamella of the jaw. The bone just mentioned was the size of an egg; was somewhat oblong; the upper side was smooth and covered with bony granulations; below it was more rounded, and divided into two unequal portions. The inner of these was extremely hard; a transverse section displayed two substances: one white and osseous, and one of a somewhat yellow color, and less dense. In the center, and inclosed by two layers of ivory-like substance, was found two cavities, of which one was twisted and the other was compressed: both were cystiform and connected with the incisor teeth. Leblank was of the opinion that the tumor was caused by a deciduous tooth which had been displaced, and had been the site of malformation early in its development.

In summing up the opinions of authorities, particular attention is invited to those of Weber, Volkmann, and Rokitansky, already cited. I may be permitted to say that the alveolar cysts do not arise after any fixed fashion, but may have a various origin. Should they arise independently of the roots of the teeth, the spongy portion of the bone is always the seat of such changes, and the steady growth gradually absorbs the hard, compact portions of the jaw, thereby giving rise to the parchment-like wall of the growth,—a feature, I believe, first pointed out by Dupuytren,—which may yield to a pressure of the finger, or may even disappear under absorption, when the cyst-wall at such points may receive for a covering the gum-tissue alone.

When, however, the origin be from the apex of the root of a tooth, we find the first and second incisor teeth are more frequently affected than the others, although the testimony of writers is not uniform on this point. Next to the incisors may be placed the bicuspid and first molar teeth, while the wisdom teeth are exempt. No cyst as yet has been observed upon these teeth. Numerous cases of serous cysts upon the roots of teeth are doubtless met with by the busy practitioner in the frequent cases of extraction coming under his care. After extraction of the offending organ, the probe, when passed along the alveolus, can define a cavity corresponding in size to that of the withdrawn sac.

Treatment.—This, for all the varieties of the cyst, is simple. The contents should be freely evacuated, the cyst carefully washed out with tepid water, and afterward with mild stimulating injections. Among these, tincture of iodine is perhaps the best, or a combination of iodine and iodide of potassium. Any remaining deformity disappears under the healing process. This may cover a period of time from eight days to many weeks.

Alveolar cysts are not apt to recur.

I will now pass to the description of the anatomical appearances of the cyst. The preparation as obtained consists of the right superior maxilla. A cyst was situated in the alveolar process over the lateral incisor tooth, with whose roots it was in close union. Its size was that of a small nut; its form oblong, round, toward the median line. Behind it was more expanded, and passed inferiorly to a rather sharply-defined border in the alveolus. Whether the root of the tooth was in open connection with the cyst remained uncertain. It was, probably, however, so associated, since a cyst similar to the one now described, but smaller,—it being no larger than a pea,—was found attached to the periodental membrane of the left central incisor.

The following are the measurements of the main cyst: greatest width, 15 min.; greatest length, 18½ min.; greatest anterior posterior measurement, 14 min.

The internal surface of the cyst presented a smooth appearance. It was one-half mm. thick. The surrounding bone was healthy, and showed no change in texture. The alveolus was much wider, and extended farther superiorly than was the case upon the other side. A small quantity of the fluid which had filled the cavity remained within it. The membrane itself had a whitish-yellow appearance, and was marked externally by a single minute vessel. The alveolus of the central incisor secures its superior wall from the membrane in which the periosteum of the tooth is inclosed. When the cystic membrane is separated from the posterior wall of the bone, there is seen extending along the entire height of the cavity a vertical canal, which in its inferior third is closed, while the superior two-thirds represent only a semi-canal, whose contents are of a yellow, viscid consistence, and appear to be identical with the cyst-contents themselves. Examination with a rather high power of the microscope showed distinctly minute blood-vessels in this glairy substance. The presence of nerve fibers was not satisfactorily determined.

In removing the cyst from its osseous bed, portions of minute blood-vessels were seen here and there, extending from the osseous boundary to the thick cell-wall. The free surface of the membrane, whose basement layer is a connective-tissue stroma, presents to the unaided eye an uneven appearance, which is due to the presence of minute, rounded papilla-like growths. These present a colloid type of structure, through which extends a cellular matrix, presenting a more or less reticulated appearance; the spaces which are in this way inclosed and filled with loosely aggregated cells of a more or less rounded form, and furnished with nuclei. The connective-tissue element is not altogether of the ordinary type, but presents a variable form,—such, for example, as spindle-cells arranged parallel to the bundles of fibers, and terminating in unipolar, bipolar, and occasionally a multipolar arrangement. All of the parts are very granular, and have, without exception, indistinct nuclei, generally inclosing nucleoli. These tissue-elements are conspicuous over the papillæ, where they attain a greater development than elsewhere, and give the papillæ a clustered as well as a fibrous appearance. In addition to these, a delicate epithelial layer is found upon the papillæ. Two distinct forms of cells are seen; one, a polygonal and a nucleated squamous form; and the other a columnar form, whose free end is covered with cilia, while the narrow basal end is lost in the basement membrane.

THE THREE ADJUNCTS.

BY S. WELCHENS, D.D.S., LANCASTER, PA.

There are three elements in the development of the dental profession which must be recognized as essential to its scientific advancement. These are, dental colleges, dental journals, and dental societies,—national, State, and local. The present status of the profession has been attained mainly through the influence and power of these helps. Our colleges have done, and are still doing, a great work; not only in educating young men in the science and art of dentistry, but in the amount and quality of learning disseminated throughout the profession. This, more than any other single influence, has done much toward the establishment of that broad and comprehensive system of scientific investigation, which has resulted in raising dentistry to the respectable position it now occupies among the professions.

This truth, felt by every practitioner in the country, calls loudly upon members of the profession, everywhere, whether graduates of colleges or not, to do their utmost to sustain them.

Public sentiment, in almost every community, demands of the individual entering upon the practice of dentistry the possession of a diploma from some respectable college, and the qualification which such an instrument indicates as necessary, just as they require the same of a medical practitioner. This healthy tone of the public mind is attributable as much to the existence of these institutions, as to the efforts and influence of their alumni.

There can therefore be no question as to the duty of all who have the advancement of the dental profession at heart, and who regard and value their own success and reputation as practitioners, to exert all their influence toward sustaining and encouraging dental colleges.

The dental journals constitute another powerful adjunct in the work of improvement, by disseminating established principles and approved methods, as well as new theories to stimulate practical experiment and scientific investigation. They are thus of the utmost importance, both to the interests of the colleges and to the profession at large. We need every auxiliary to aid us to keep abreast of the times, and if we ignore the journalistic element, and rely alone upon the knowledge previously acquired from the text-books, we shall probably lose that which we had attained, and fall imperceptibly to the level of the quack.

We cannot conceal the fact that a substantial and efficient literature is one of our strongest elements of improvement. If this be disregarded, a high standard of excellence cannot be secured. No practitioner, however well his mechanical operations may be performed, can hope, except by study, to keep up with the progressive spirit of the profession. If he ceases to be a student, then should he also cease practicing. Its literature is the light and life of every profession, and a drone who will not read brings disgrace upon his calling.

All that is necessary to make a good dentist cannot, of course, be obtained from the journals alone; but the habit of reading and study will create a desire for fuller information, and will become a powerful stimulant to higher aspiration and more earnest effort. Dental journals are essential adjuncts, and should be recognized and sustained as such.

The national, State, and local societies may not be regarded by some as of much account in the work of improvement in the dental profession. But little interest is taken by many in the cultivation of the social relations, and association for mental development is little thought of. Prejudice and jealousy are also responsible for exclusiveness, but when the binding force of social and fraternal intercourse is neglected there is no safeguard for professional integrity. The best men of our profession are too generally strangers to each other. Through the journals they have learned to know each other's minds, but they do not know their hearts.

Until recently, societies had not made their influence for good felt as it should be. They had been mutual admiration conclaves, from which those who most needed their help were excluded.

Thus the social relations of the members of our profession were neglected,—prejudice and professional jealousy compelled every man to "go it alone," and at daggers' points with his brother. There was thus but little incentive to scientific investigation, and no unity or concert of action. What wonder that quackery made such rapid strides!

This state of things, however, has undergone a decided change of late. There are more societies now, constructed of better material, and on more liberal principles. And just in proportion as our local and State societies have increased in number and respectability, has dentistry advanced in social status and scientific excellence.

There are good working local societies, numbering from twenty to sixty earnest, active members, in communities where, ten years ago, there were scarcely five dentists on speaking terms, and it was a rare thing indeed ever to see one visit the office of another. This exclusiveness has almost entirely disappeared. There is now a friendly intercourse, a cordial, social greeting, and there is a friendly, helping hand extended by our most skillful operators to those who are less fortunate or younger in the practice, but no less earnest in their endeavor to excel. We have learned to know each other's hearts, to cultivate and appreciate each other's manliness, to sympathize with and supply each other's wants in practice, and to compare experiences with the new appliances that are crowding upon us. This is some of the work we are doing in our local societies through the country, and there is not a man among us who does not feel that he is not only a better and more useful citizen, but a far superior dentist by reason thereof.

From the local societies we pass into the State, and thence into the national societies. In these enlarged organizations there is a broader range of discussion, but by no means an advance in the important element of social culture.

Now, we hold that the influence which is exerted by these associations can no more be dispensed with than either of the other elements named. The three adjuncts form a system, each with its respective function, and all necessary to permanence and progression. The colleges appeal to the profession at large for support, and cannot be sustained without that support. The journals do the same thing. They have made themselves a necessity, and, as we have seen, no practitioner of any character or standing can afford to do without them. We, therefore, upon the part of the profession at large, and of the societies, appeal to the colleges and journals for their influence and support. We think that those associations are indispensable to the prosperity of the dental profession, and feel that they deserve at least a passing notice of commendation, and an occasional toast at entertainments, and much more than a promise to attend their meetings, upon the part of the teachers in the schools and the editors of the journals. We ask you, gentlemen, to meet with us, and take part in our exercises. If mutual support is desired, let it be mutual and not one-sided. We want your presence and your counsel, to make the three adjuncts harmonious.

CO-OPERATION OF MEDICAL MEN WITH DENTISTS.

BY S. S. BLODGETT, D.D.S., OGDENSBURG, N. Y.

(Extract from a paper read before the St. Lawrence County Medical Association, at Ogdensburg, N. Y., December 12th, 1872.)

My immediate object, gentlemen, in intruding upon your time and patience, is to secure your co-operation with the intelligent dentist in the work of preserving the teeth.

From the earliest period of intra-uterine existence until the eruption of the permanent set of teeth, the family physician sustains such relations that his teachings and advice have much to do with the future health of his patients' teeth.

I would have the family physician cognizant of the food used by the mother before the birth of the child, and especially during the period of lactation, while the teeth are in process of formation.

I would have the physician insist that an intelligent dentist examine the child's mouth frequently during the eruption of the teeth, and especially during the changing of the temporary for the permanent set.

We all know that the period of teething is one of anxiety, but the days and nights of anxious watching, and the bereavement it too often entails, may be saved by timely and intelligent treatment.

As an earnest of what I mean, let me call your attention to the six-year molars of our little ones. There are no teeth of more importance, and yet if you will take the trouble to look at the mouths of the children of your patients,—particularly those of what we term the better or middle class,—you will find these teeth, in nearly every instance, badly decayed, or entirely gone.

You will find more persons in St. Lawrence County at the age of forty or fifty years with these teeth perfect, than you will in the mouths of their children of ten to fifteen years.

This to the intelligent dentist is a frightful outlook, and unless parents and physicians co-operate with the dentist in arresting this destruction, we shall have, in course of time, a change in the character of face of our people,—a deformity resulting from the loss of these teeth.

I ask your co-operation, gentlemen, in arresting this wholesale extraction of teeth. It is no more the province of a dentist to extract a tooth than of a physician to amputate a limb without an effort to save it; and, in these days of universal culture, the profession of dentistry has made such advances, that teeth are now preserved for a long time, which, a few years ago, it would have been considered impossible to save. This has been accomplished by the better education of the dentist, and the empiric in our profession no more challenges your confidence or respect than does the charlatan in yours.

I ask you, gentlemen, in diagnosis of disease, to take into consideration the condition of the mouth. Think you it is possible that your remedies will avail in a case where one, two, or perhaps more, ulcerated teeth are discharging fetid matters into the stomach at every act of deglutition, and poisoning the air at every inspiration? To the cesspool we apply disinfectants as a sanitary precaution. I beg you to see to it that your patients are not poisoned by the inhalation of odors more deleterious than those of the cesspool.

I have thus tried to throw out a few suggestions,—to direct thought in a channel that may be of use to our common humanity.

PROCEEDINGS OF DENTAL SOCIETIES.

SUSQUEHANNA DENTAL ASSOCIATION.

THE seventeenth semi-annual meeting of this association convened at Lock Haven, November 13th, 1872, at 10 A.M. The President, Dr. Martin, in the chair.

A new feature introduced at this meeting was a "Question Box," into which questions were placed, to be answered by the association at stated periods. Many of the questions thus brought up were fully discussed, adding variety and interest to the meeting.

Question Box. Has any member present used whalebone rubber, and with what success?

Dr. Dieffenbacher had used it where the ordinary red rubber irritated the mouth too much; and also where he desired more strength.

Dr. Sticker had used it, but does not like it; it makes homely, dark work.

Dr. Beck filled a large crown cavity in a molar, before the association, with an electro-magnetic plugger, to the satisfaction of all present.

The essayists being called for, Dr. Gerhart responded with an essay on the "Proper Materials for Filling," stating that tin foil in many cases was preferable to gold, both on account of its cheapness and comparative durability. Especially in the young, whose teeth are porous, it seems to be preferable to gold, on account of having better preserving qualities.

Dr. Wingate thinks, for certain patients, tin will answer very well.

Dr. Beck has filled such teeth under protest with tin, where patients were abundantly able to pay, and has never seen such fillings do well, especially in approximal cavities; objects to filling even children's teeth with tin foil; thinks that nearly all decay that starts under fillings is caused by imperfect work.

Dr. Klump thought it required quite as much, probably more, skill to insert a good tin filling as gold; had seen fillings, approximal and even contour, that had been inserted years before, which were yet solid and comparatively well polished, and doing good service; thought that imperfectly filling caused the loss of quite as many teeth as choice of material.

Dr. Beck thought that most imperfect operations were caused by working too rapidly, or rather for want of time. Where an operator can fill four or five teeth in an hour, you may be almost certain to find defective fillings. He never would use tin for filling teeth for a lady with light hair and complexion, because such teeth would be sure to discolor; does not believe tin fillings can, in an approximal case, last anything like thirteen years, as asserted.

Dr. Martin, the next essayist, being called for, responded with an essay on "The Proper Preparation for the Doctor of Dental Surgery." He strongly recommended a more thorough *education* among the members of the profession, and urged them to aim high.

A general discussion followed, nearly all the members agreeing with the essayist.

Question Box. Has any gentleman present seen cases where salivation has occurred from wearing rubber plates?

Drs. McClure and Newell had seen such cases, and one case was cited where a certain M.D. attributed the death of a patient to such a plate.

Dr. Williams thought all such symptoms were caused by badly-fitting plates, since he has frequently cured such cases either by refitting the same plate, or by making a new one of the same kind of material.

Dr. Dieffenbacher had inserted hundreds of sets of teeth, but had never met with but one such case.

Dr. Klump. This is a question which has always had firm adherents *pro* and *con.*; but for any one to assert that a certain kind of plate had killed a patient, was making too strong an assertion to go uncontradicted. That there may be cases where, from the idiosyncrasy of patients, they cannot wear rubber is possible, since we know that some drugs, harmless to most people, are virulent poisons to others. Physicians as well as dentists sometimes assign such reasons when they cannot explain remote causes. There can be no objection to black rubber, since that is entirely free from any form of mercury.

Dr. Missimer believed bad-fitting plates, causing mechanical irritation, had vastly more effect in these special cases than the small amount of vermilion; has seen metal plates cause this peculiar sore mouth as well as rubber.

Dr. Williams referred to cases where metal plates caused the same kind of irritation, and even where they were cured by inserting a good-fitting rubber plate instead.

The next business in order being the discussion of the regular subject, "Dental Implements and Appliances," Dr. Beck opened the subject. He said it was truly wonderful to notice the many new and useful implements and appliances in dentistry. He lauded the electro-magnetic plugger and the different dental engines as great improvements, and great savers of time; but for an operator to claim to be able to do a certain amount of work in a given time is no evidence of ability or skill. Perfect operations require time, with all the improvements we may get.

Dr. Wingate, since nearly all the new machinery had been referred to, spoke of his method of keeping the mouth dry during operations; uses partially worn-out table-linen, cut into pieces and placed around the teeth, instead of bibulous paper.

Dr. Rank uses napkins to keep the mouth dry in connection with spunk; uses Goodwillie's inhaler for administering chloroform, and simple pluggers for filling.

Dr. Missimer, to avoid the usual annoyance of soiled hands in packing rubber, starts first with Clark's brass flask. His hand-clamps are also of brass, of his own design; these he uses to screw up the flask while in a vessel of boiling water. Instead of black lead on the packing, he uses French chalk, or soapstone, such as is sold in shoe-finding establishments. This he sprinkles over the screw and packing each time before screwing up his vulcanizer, and it acts both as lubricator and packing.

Dr. Wagner, for filling, uses rubber dam and simple pluggers.

Dr. Dieffenbacher says, for keeping the mouth dry, nothing is equal to rubber dam; uses linen lint to dry cavity, and sometimes spunk; uses steel crabs to retain rubber dam.

Dr. Barrett. The electrical appliances commend themselves to every operator. They are the best of this class of machines; but in a few years we may have something better. Is pleased with Dr. Missimer's way of vulcanizing.

Dr. Klump thought that properly the subject of "Dental Instruments and Appliances" did not include mode of operating; gave a description of the various new appliances on exhibition at State and national dental associations: Green's electric burring engine, plugger, and fan; Bonwill's electric plugger, Mack's screws, and the diamond-pointed drills.

Dr. Wingate uses pads in handling flasks.

Dr. Sticker uses packing from hardware stores for vulcanizer.

Dr. Griffith uses ordinary rubber packing, and has no difficulty.

Dr. Missimer has not repacked his vulcanizer for six years.

Drs. Rank, Wagner, and others use buckskin gloves to handle flasks

Drs. Gerhart and McClure described methods of making dies for rimming plates.

The next subject, "Saliva, and the Best Mode of keeping the Mouth Dry," was taken up.

Dr. Beck spoke of the annoyance of viscid saliva in making good dental operations, and demonstrated the comparative superiority of bibulous paper over cotton in drying out cavities; uses napkins of finest bird's-eye linen, from two to four inches square; folds in the four fringed sides. They are secured by simple adhesion. He believes there are some mouths where good submarine fillings might be made.

Dr. Wingate. Saliva, though very useful and necessary in the mouth, is, when filling teeth, very objectionable; uses napkins and rubber dam to keep the mouth dry.

Dr. Sticker thinks all such appliances useful just in proportion as they keep the mouth dry; sometimes uses small linen napkins between the lips and teeth, retained in position by placing little pegs between the teeth.

Dr. Missimer, in labial cavities of incisors, where the rubber dam cannot be carried above the margin of cavity, on account of the cavities extending up so much higher than the gums between the teeth, uses napkins with narrow strips of spunk pressed between the gums and necks of teeth; thinks it best not to be too willing to please a patient against your own judgment. The patient will in the end be pleased, if the work is well done.

Dr. Rhoads had never had the success in using rubber dam some had, and found difficulty in using it on centrals and laterals.

Dr. Klump uses rubber dam mostly, and is now able to apply it where he once thought it impossible so to do, and believes that it can be used in every case that presents, although sometimes with great difficulty. Where the gums extend below the cavity, presses them away by packing cotton in the cavity and letting it remain some time; repeating, if necessary.

Dr. Gerhart uses as few appliances as possible; uses cotton over the napkin, because it does not so readily absorb moisture.

Dr. Beck stated that he had kept a cavity dry three hours in a difficult operation, and gave a description of the case.

Dr. McClure. His mode of operating had been well expressed by former speakers; uses cotton for drying out cavities.

Dr. Griffith. The best absorbents are spunk and bibulous paper.

Dr. Richards uses rubber dam and spunk; agrees with Dr. Beck in making simple cavities of compound ones, and believes it necessary to have the same shaped instruments in excavating the cavity as you would to fill it.

In the evening, Dr. Beck delivered a very instructive public lecture before the association.

Question Box. Does any one present use celluloid?

Several members had used it, but were not prepared to give a decided opinion of its merits.

On motion, Drs. Gerhart and Martin were requested to furnish their essays for publication.

Dr. Beck was also requested to furnish his lecture for publication.

Subjects for discussion at the next meeting are, "Contour Fillings" and "Hemorrhage during Dental Operations."

Essayists, Drs. Wingate, Sticker, Parry, and Barrett.

Drs. McClure, Blesh, and Griffith were admitted to membership.

Adjourned to meet in Wilkesbarre, May 14th, 1873.

The attendance was good, and harmony and good feeling prevailed during the session, which was both interesting and instructive.

G. W. Klump, D.D.S., *Recording Secretary.*

DENTAL ALUMNI ASSOCIATION OF HARVARD UNIVERSITY.

The second annual meeting of the Dental Alumni Association of Harvard University was held at the Revere House, Wednesday, February 12th, at half-past five o'clock P.M.

After an hour spent in pleasant social intercourse, the association sat down to dinner, Dr. J. T. Codman, president of the association, presiding.

After dinner, speeches were made by Mr. C. S. Tomes, of London, England; Drs. Cook, of Brooklyn; Bogue, of New York; E. G. Tucker, of Boston; T. B. Hitchcock, Dean of the Faculty, and many members of the association.

The meeting was well attended, and characterized by much good feeling, members all expressing themselves as desirous of, and determined to do all in their power in support of, the high standard taken by their Alma Mater in dental education.

The following officers were elected for the ensuing year:

President.—Thomas Fillebrown, Lewiston, Maine.

Vice-President.—Samuel F. Ham, Boston.

Secretary.—George F. Grant, Boston.

Treasurer.—Charles E. Hussey, Biddeford, Maine.

BALTIMORE COLLEGE OF DENTAL SURGERY.

The thirty-third annual commencement of the Baltimore College of Dental Surgery was held in Baltimore on Thursday evening, February 27th, 1873.

An address was delivered by J. B. Ten Eyck, M.D., of the graduating class; the valedictory by W. W. H. Thackston, M.D., D.D.S.

The number of matriculates for the session was fifty-five.

The degree of D.D.S. was conferred on the following members of the graduating class by Prof. F. J. S. Gorgas, M.D., D.D.S. :

NAME.	RESIDENCE.	THESIS.
Andrew Abendschein	Maryland	Fifth Pair of Nerves.
Edward Alfred Becht	Holland	The Extraction of Teeth.
William Benson, Jr	Maryland	Nitrous Oxide as an Anæsthetic.
Joseph Clark Brown	North Carolina	Preservation of the Teeth.
Edward Wadsworth Bryan	Texas	Digestion.
George H. Chewning	Virginia	Extraction of Teeth.
Eugene Crabbe	Virginia	Treatment of Exposed Pulps.
J. Ormsby Donogh	Ohio	Physiology of Sensations.
Emilie Foeking	Prussia	Is Woman adapted to the Dental Profession?
Solomon German	Maryland	Development of the Teeth.
Samuel Phillips Grafflin	Ohio	Caries of the Teeth.
Charles Sylvester Grindall	Maryland	Organs of Digestion and their Functions.
James A. Hart	Georgia	Caries of the Teeth.
Samuel Thomas Henkle, M.D.	Maryland	Dentigerous Cysts.
Frank Spencer Lewis	Maryland	The Oral Cavity.
Charles Wilhelm Lichtenberg	Illinois	Alveolar Abscess.
James Smith Linthicum, M.D.	Maryland	Improvements in Dental Surgery.
Calder Little	Maryland	The Vacuum Cavity.
Joseph McJordan	Virginia	Diseases of the Teeth.
Charles Hanson Morgan	West Virginia	Extraction of Teeth.
Robert Spotswood Switzer	Virginia	Dentition.
Jerome B. Ten Eyck, M.D	Michigan	Predisposing Causes of Dental Caries.
John Hilery Vaughan	Virginia	Dental Medicine.
John William Welsh	Maryland	Nitrous Oxide Gas.
George Milnor Wentworth	Massachusetts	Formation of the Teeth.
George E. Wiley	Virginia	The Teeth.
Jacob Henry Yost	Virginia	Atrophy and Denuding of the Teeth

ILLINOIS STATE DENTAL SOCIETY.

The ninth annual meeting of the Illinois State Dental Society will be held at Rock Island, Illinois, beginning on Tuesday, the 13th day of May, 1873.

Discussions will be held conjointly with the Iowa State Society, and a very profitable and largely attended meeting is anticipated.

All are cordially invited to attend.

Charles R. E. Koch, *Secretary.*

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The seventeenth annual commencement of the Pennsylvania College of Dental Surgery was held at the Academy of Music, Philadelphia, Saturday, March 1st, 1873, at eight o'clock P.M.

The address to the graduates was delivered by Professor J. Ewing Mears; the valedictory by Jos. Pettit, D.D.S.

The number of matriculates for the session was seventy.

The degree of D.D.S. was conferred upon the following members of the graduating class by W. L. Atlee, M.D.:

NAME.	RESIDENCE.	THESIS.
Weirich Z. Bentz	Pennsylvania	Continuous Gum.
Ira Brown	Ohio	Human Teeth and their Liability to Caries.
Lannes B. Bryan	West Virginia	Facial Neuralgia.
José M. Bustillo	Cuba	Inflammation.
Pedro Calvo	Cuba	Diseases of the Inferior Maxillary Bone, and Operations practiced on the same.
Carlos N. Clemenceau	Cuba	Alveolar Abscess.
William B. Chambers	Ohio	The Origin and Use of Chloroform.
Charles B. Davies	Ohio	Circulation of the Blood.
Leonidas Espinoza	Central America	Tartar or Salivary Calculus.
Peter K. Filbert	Pennsylvania	Filling Teeth.
Adam J. Flickinger	Missouri	The Teeth, their Origin and Development.
George W. Greene	Pennsylvania	Physiology of the Brain.
Benicio Guerrero	Central America	Syphilitic Affection of the Periosteum and Bones.
Edward P. Kremer	Pennsylvania	The Prevention and Arrest of Caries.
Herman N. Loeb	Pennsylvania	Extraction of Teeth.
Evan B. Long	Pennsylvania	The Anatomy of the Teeth.
Henry C. Mansfield	Wisconsin	Dentistry.
Melvin A. Newman	New York	Comparative Anatomy of Teeth.
Joseph Pettit	Pennsylvania	Inflammation, its Causes, Effects, and Treatment.
Henry R. Phillips	Illinois	Caries.
Joaquin Silva	Cuba	Affections of the Teeth.
David Smith	Georgia	Necrosis of the Maxillæ.
Thomas H. Smith	Ohio	Dentition.
Stoddard Southworth	New York	Bleaching Teeth.
Eugene S. Talbot	Illinois	Artificial Dentures.
John S. Thompson	South Carolina	Filling Teeth.
Cornelius W. Unger	Ohio	Caries of the Teeth.
James N. Warner	North Carolina	Practice of Dentistry.

CALIFORNIA STATE DENTAL ASSOCIATION.

The California State Dental Association will commence its fourth annual session in San Francisco, Tuesday, May 20th, 1873, at ten o'clock A.M. Every member of the profession on the Pacific coast is cordially invited to be present. The session will continue four days. Clinics daily.

H. J. Plomteaux, *Recording Secretary.*

PHILADELPHIA DENTAL COLLEGE.

The tenth annual commencement of the Philadelphia Dental College was held at the Academy of Music, Friday, February 28th, 1873, at eight o'clock P.M.

The address to the graduates was delivered by Prof. J. H. McQuillen; the valedictory by S. E. Knowles, M.D., of California.

The number of matriculates for the session was ninety-one.

The degree of D.D.S. was conferred upon the following members of the graduating class by Hon. Jas. Pollock:

NAME.	RESIDENCE.	THESIS.
Wm. J. Barton	Missouri	Elements of Success.
Samuel T. Boggess	Ohio	Dental Prosthesis.
R. W. Brown	Wisconsin	Exposed Dental Pulp.
H. A. Costner	North Carolina	Functions of Digestion.
Ricardo Crombe	Mexico	Development of the Teeth.
Wm. Cutler	New York	Dental Pathology and Surgery.
Henry E. Debonneville	Switzerland	Mastication.
W. Doherty	Pennsylvania	Extraction of the Teeth.
Samuel B. H. Faught	Georgia	Inflammation.
Francis M. Fay	Belgium	Treatment of Exposed Pulps.
Varley George Fay	Belgium	Disease of the Roots of Teeth.
Perley Fuller	Ohio	Causes of Caries of Human Teeth.
W. F. Galbreath	Ohio	Carbolic Acid.
L. S. Gilliams, M.D.	Pennsylvania	Circulation.
Edw. L. Guffin	Illinois	Inflammation.
Cyrus Hamilton	Nevada	Nutrition.
A. T. Hawley	New York	Dentition.
Wm. H. Hertz	Pennsylvania	Nitrous Oxide Gas.
Harry Hoppe	Denmark	Inflammation.
R. J. Husband	Canada	Neuralgia.
W. W. Johnson	Maine	Plaster Impressions and Casts.
G. W. Keiser	Ohio	Indications for Extraction.
Ralph T. Kirkland	New York	Necrosis.
S. E. Knowles	California	Pathology of Caries.
Carlos Koth, Jr.	Portugal	Pathology of Dental Pulp.
F. V. Marin	Cuba	Exposed Pulp and its Treatment.
Joseph Machwuerth	Bavaria	Alveolar Cysts.
Samuel Minster, Jr.	New York	Caries of the Teeth.
H. W. Morey	Ohio	Development and Structure of Teeth.
Whiteford McConnell	Canada	The Dentist.
Andrew McKinney	Canada	Dental Caries.
F. R. Navarro	Cuba	Scorbutus.
C. L. Newcomb	Nova Scotia	Extraction.
Jos. W. Palmer	Massachusetts	Maxillary Sinus.
W. E. Pinkham	Massachusetts	Dental Pathology.
Victor Ponce de Leon	Bolivia, S. A.	Blood and its Circulation.
M. J. Quintero	Cuba	Extraction of Teeth.
John Pugh	Pennsylvania	The Teeth.
Wm. L. Schibbye	Denmark	Teeth, their Value and Appreciation.
Francis A. Shailer	Connecticut	Deciduous Teeth.
E. G. Smith	Wisconsin	Chloroform.
Theo. E. Swift	Connecticut	Efficient Means of Arresting Alveolar Hemorrhage.
S. Tibbetts, Jr.	Maine	Separation of the Teeth.
O. K. Waldron	Pennsylvania	Harelip.
Edward Y. Webb	Bahamas	Alveolar Abscess.
E. Meigs Wells	New York	Staphyloraphy.
Thos. H. Williamson	New Jersey	Circulation of the Blood.
H. Dion Young	Canada	Nitrous Oxide.
S. Zimmerman, D.D.S.	Canada	Internal Maxillary Artery.

NEW YORK COLLEGE OF DENTISTRY.

The seventh annual commencement of the New York College of Dentistry was held in Irving Hall, on Friday evening, March 7th, 1873.

The address to the graduates was delivered by F. LeRoy Satterlee, M.D., Ph.D.; the valedictory by Chas. M. Howe, D.D.S., of the graduating class.

The faculty prize, offered to the student who passed the best examination in all the departments, was awarded to Charles M. Howe, D.D.S.

A written examination, in the presence of each examining professor, is made to take the place of the usual thesis, and is an addition to the oral examination.

The number of matriculates for the session was thirty-nine.

The degree of D.D.S. was conferred upon the following graduates by the President, Dr. S. A. Main:

NAME.	RESIDENCE.	NAME.	RESIDENCE.
Robert M. Reynolds	New York.	Rudolph F. Winkel	Germany.
Wm. C. Michaelis	New York.	Charles M. Horn	New Jersey.
Philip J. Koons	New Jersey.	Clarence A. Wells	New York.
Thomas Steinagel	Illinois.	Gustavus Haas	New York.
John C. Miller	New York.		

AMERICAN DENTAL ASSOCIATION NOTICE.

The Committee on Literature of the American Dental Association would request members of the profession to inform them of any new works which have appeared, or may appear before the next annual meeting of the association, in order that no work which should properly be considered by the committee need be overlooked by them.

Geo. H. Cushing, *Chairman*, 550 Michigan Av., Chicago.
E. A. Bogue, 29 East 20th St., New York City.
C. N. Peirce, Philadelphia.

WASHINGTON CITY DENTAL ASSOCIATION.

At the sixth annual meeting of the Washington City Dental Society the following officers were elected:

President.—Dr. R. B. Donaldson.
Vice-President.—Dr. J. Curtiss Smithe.
Secretary.—Dr. M. C. Thompson.
Treasurer.—Samuel Lewis.
Librarian.—Dr. H. N. Wadsworth.

M. C. Thompson, *Secretary.*

NEW ORLEANS DENTAL COLLEGE.

The seventh annual commencement of the New Orleans Dental College was held at the College Hall, New Orleans, on Saturday, March 1st, 1873.

The address to the graduates was delivered by Prof. James S. Knapp, D.D.S.; the address to the faculty and students by Prof. James Burns, M.D.; the valedictory by J. Rollo Knapp.

The number of matriculates for the session was eighteen.

The degree of D.D.S. was conferred upon the following graduates by Prof. James S. Knapp, Dean:

NAME.	RESIDENCE.	THESIS.
John N. Goolsbee	Texas	Filling Teeth.
Daniel L. Ricks	Georgia	Diseases of Maxillary Sinus.
James M. Laster	Tennessee	Prophylactic Dentistry.

The honorary degree of D.D.S. was conferred upon Ransom L. Harris, of Iowa, and Robert J. Hamill, of Texas.

BOSTON DENTAL COLLEGE.

The fifth annual commencement of the Boston Dental College was held at Wesleyan Hall, Boston, on Monday, March 3d, 1873.

Dissertations were read by A. T. Bigelow, F. A. Gay, and W. H. Tillinghast.

An address was delivered by Prof. F. W. Clarke, S.B., and the valedictory by A. T. Bigelow.

The number of matriculates for the session was eleven.

The degree of D.D.S. was conferred on the following members of the graduating class by Prof. D. S. Dickerman, M.D., D.D.S.:

NAME.	RESIDENCE.	THESIS.
Alexander Thompson Bigelow	Clinton, Mass.	Oral Digestion.
Warren Henry Tillinghast	Johnston, R. I.	Digestion.
Horace Augustus Mansfield	Wakefield, Mass.	Circulation and Uses of the Blood.
Clarence J. Cheney	Cambridge, Mass.	Development and Preservation of the Natural Teeth.
Pedro Cazenave	Montevideo, S. A.	Filling Teeth.
Elmore F. Brackett	Boston, Mass.	Anæsthetics.
Frederick Albert Gay	Providence, R. I.	Circulation of the Blood.

MISSOURI DENTAL COLLEGE.

The seventh annual commencement of the Missouri Dental College was held in Temple Building, St. Louis, on Thursday, March 13th, 1873.

The valedictory address was delivered by Dr. Baislineire.

The number of matriculates for the session was sixteen.

The degree of D.D.S. was conferred upon the following members of the graduating class by Prof. J. T. Hodgen, M.D.: H. H. Keith and W. C. Jocelyn, of St. Louis; R. H. Mace, of Illinois; D. B. Campbell, of Missouri; and R. L. Cochran, of Iowa.

DENTAL SCHOOL OF HARVARD UNIVERSITY.

THE fifth annual commencement of the Dental School of Harvard University was held at the Massachusetts Medical College, Boston, Wednesday, February 12th, 1873.

The address was delivered by Mr. Charles S. Tomes, M.A. Oxon., M.R.C.S., L.D.S., of London, England. Dissertations were read by Wm. Herbert Rollins and Charles Albert Brackett, of the graduating class.

The degree of Dental Medicine was conferred by the President, Chas. W. Eliot, LL.D., upon the following members of the graduating class:

NAME.	RESIDENCE.	THESIS.
Chas. Albert Brackett	New Hampshire	Deposits on the Teeth.
Edward Augustus Dimmick	Massachusetts	Preservation of the Teeth.
Geo. Henry Knowles	Massachusetts	Materials used for Filling Teeth.
Wm. Herbert Rollins	Massachusetts	Dentition of the Elephant of Asia.
Chas. Herman Wolfe.	Nova Scotia	Diseases of Children connected with First Dentition.

EDITORIAL.

SYSTEMIC DERANGEMENTS MANIFESTED IN THE MOUTH.

VARIOUS expressions in the mouth of morbid constitutional conditions have been glanced at in previous papers. A further consideration of the subject might include numerous other aberrations having significant pathological relations with the oral cavity. Vitiated mucous and gastric secretions, acting—doubtless by interference with nutrition as well as by chemical action of the abnormal fluids—upon the calcareous salts of the hard tissues, cause their disintegration; acting upon the soft tissues, cause ulcerations of the mucous membranes and recession of the gums. The inorganic salts precipitated from the saliva (and which, mixed with epithelium, mucus, organic constituents of the saliva, and with variable accidental substances, are deposited upon the teeth) express, by their character and quantity, systemic pathological conditions. These not only create local mischief, but their vitiated products cause an irritation of the mucous membrane of the alimentary tract, resulting in impairment, by this means as well as by their presence, of the digestive fluids. The exhalations from a mouth so diseased may also produce an injurious effect upon the bronchi and lungs, and through them upon the blood. A vicious circle of pathological relations is thus shown,—the health of the dental organism suffering from systemic derangement and further constitutional mischief resulting in its turn therefrom.

Systemic conditions favoring hemorrhage from the alveolus after tooth extraction, or even consequent upon lancing the gums, are also of special interest and significance.

The manifestations of impaired nutrition, and the depressed condition of the vital powers shown in necrosis of the maxillæ; in follicular, ulcerative, and gangrenous stomatitis; in glossitis, and in various other expressions of systemic derangement, are also of special diagnostic value.

Abnormal systemic conditions are also strikingly indicated in the sordes which accumulate upon the teeth in various fevers and other derangements of health.

The changes in the mucous secretions of the mouth, which in deranged conditions of the general health become excessively alkaline and viscid, are worthy of investigation, as indicative of morbid systemic tendencies.

The numerous and marked changes in the salivary secretion are also significant of systemic inharmonies, and are valuable diagnostic signs. A deficiency or hypersecretion of saliva, an undue alkalinity or acidity, the presence of bile, urea, or other anomalous ingredients, show digestive, hepatic, renal, or nervous derangements, and may be prognostic of rheumatic, gouty, diabetic, or other aberrations. An important diagnostic indication is found in facial pains existing without obvious explanation in the acidity or alkalinity of the saliva. If purely nervous in character, the saliva will be found distinctly alkaline; while if of rheumatic origin, it will be as distinctly acid. The character of the salivary secretion, it has also been recently claimed, is a valuable diagnostic sign in mental derangement, indicating the portion of the nervous system pathologically affected.

A derangement of the secreting glands, as in catarrh, mumps, and quinsy, may also give rise to an abnormal saliva.

The tongue, as an index of systemic condition, affords, doubtless, more varied information than any other single means of diagnosis. Its bulk, color, dryness, or moisture, the character of its surface, of its coatings, and its movements, show to the skilled observer the character, degree, progress, and stage of systemic derangement, and give him indispensable data of diagnosis and prognosis. The diagnostic signs afforded by the tongue have been laboriously studied by many observers, but the various other manifestations alluded to, and numerous others which might be enumerated, have not yet received the attention to which they are entitled. Careful and elaborate analyses of all the secretions and excretions of the body have been made to determine their normal constitution, but a wide field is open to the pathologist for as careful and elaborate an analysis of them in cachexiæ and acute diseases.

If morbid conditions of the oral secretions had no other significance than their mischievous influence upon the teeth, and their interference with the success of dental operations, there would be in these directions alone sufficient stimulus to careful investigation; but the systemic conditions thus manifested have a vastly wider range of meaning, and a thorough elucidation of their morbid changes would contribute largely to the better comprehension of systemic disturbances and the rationale of their treatment.

There can be little doubt that every well-pronounced cachexia, and every distinct acute disease, have characteristic expression in the variations of the oral secretions; nor that these variations would throw as much light on many abnormal conditions as do like variations in the urinary secretions.

EYES HAVE THEY, BUT THEY SEE NOT.

In a notice of Prof. Wedl's work on the "Pathology of the Teeth," which appeared in the Dental Cosmos for November, the book was commended because "suggestive of that education which every professional man should aspire to who has respect for the meaning of his doctorate," and because it furnished "evidences of diligent research and labor in the special direction indicated by its title." Dissatisfaction was, however, expressed with the *style,*—the quality of which was described as "hazy," and because of the fact that, "just in proportion as the discussion approaches the sphere of the practical and useful, the descriptions grow meagre, and the deductions applicable in practice are left to the reader." On these grounds, the otherwise favorable notice of the work was qualified in the following terms:

"Knowledge, however, is valuable in proportion to its applicability; and teaching is valuable only in proportion as it confers knowledge available for the purpose designed. We regret to say that, judged by this standard, a large portion of this volume will, we think, prove unsatisfactory," etc.

The *Boston Medical and Surgical Journal* thus translates the meaning of this qualification:

"Prof. Wedl's work on the 'Pathology of the Teeth,' according to the Dental Cosmos, contains so much that is new as the result of German investigation, that it surpasses the comprehension of most of our American students;" and adds: "We cannot help feeling that such views are behind the day; that they are unwarranted in fact and unworthy to be advanced by dental educators."

The *Boston Journal's* conception of the criticism, and its comments thereon, are copied with approval by the *American Journal of Dental Science.*

We submit that a careful reading of the notice would have saved them both the unpleasantness of misrepresenting the writer's opinions.

LEGISLATION IN NEW JERSEY REGULATING THE PRACTICE OF DENTISTRY.

An act to regulate the practice of dentistry in New Jersey, and to protect the people against empiricism in relation thereto, has become a law in that State, and takes effect immediately. The act is similar in its general provisions to that passed in the State of Georgia, and which was published in the DENTAL COSMOS for November, 1872.

A similar bill, presented to the Legislature of Pennsylvania, failed to receive the support necessary to its passage.

SPRING AND FALL COURSES IN THE DENTAL COLLEGES.

The faculties of the Pennsylvania College of Dental Surgery, and of the Philadelphia Dental College, each announce a spring and fall course. Lectures in each institution commenced on the first Monday in April, to continue until the last of June; the fall course from September 1st to November. The regular or winter session remains unchanged.

This feature, involving a serious addition to the labors of the faculties, should receive the cordial support of the profession.

BIBLIOGRAPHICAL.

DENTAL CARIES AND ITS CAUSES. AN INVESTIGATION INTO THE INFLUENCE OF FUNGI IN THE DESTRUCTION OF THE TEETH. By Drs. LEBER and ROTTENSTEIN. Translated by THOMAS H. CHANDLER, D.M.D., Professor of Mechanical Dentistry in the Dental School of Harvard University. With Illustrations. Philadelphia: Lindsay & Blakiston. 1873.

In the diversity of opinion which exists in regard to the histologic changes taking place in the process known as dental caries, any investigations tending to elucidate the subject should be welcomed by every member of that profession whose business it is to combat the evil. The work before us, giving the results of patient observation, presents the deductions of its authors with a perspicuity and modesty calculated to secure for its positions a thoughtful consideration.

Opening with a résumé of the various opinions held in reference to the nature of dental caries, the anatomical alterations occurring during the process are carefully presented, followed by a consideration of the progress, symptoms, and causes, predisposing and active,—the fungiferous relation of caries being the burden of the book. Though the influence of fungi in the production of dental caries has not previously received the systematic examination which our authors have given it, yet it has not by any means been overlooked. More than one observer has called attention to the subject, and Dr. Garretson, in his "System of Oral Surgery," records a series of experiments, which exhibit the fact that fungi are to be met with, not only in teeth affected with caries, but in mouths of all descriptions. It is conceded, however, that no previous author has ventured his reputation upon the theory that a parasitic element plays so important a part in the production of dental caries, nor in the manner therein described.

There is much in the volume that is plausible as well as novel, and whether the views advanced are to be established or set aside by subsequent investigation, the book, like all "one side" books or "one side" men, has the merit of directing especial attention in a particular direction, and will doubtless be thus productive of good, whatever become of the theories it advances. Experience has taught us that, while it may be prudent to receive new opinions with caution, it is impolitic to condemn them without thorough examination. To reject the new before investigation and discussion have determined its value, is as unwise as to embrace it without ample evidence. The views advanced will, it may be assumed, be thoroughly investigated by numerous observers, and confirmed or refuted. In the mean time, he but poorly deserves a place in the ranks of science who ignores the innovation thus boldly made upon previous opinions. Whether the explanation of the origin of dental caries is to be found chiefly in disintegrative chemical processes, or whether it has a pathological significance as a departure from physiological condition, not to be fully explained, except on the chemico-vital theory, we cannot afford to overlook the participation of fungi in the work of destruction, nor the therapeutic conclusions and practice based on this theory.

We heartily commend the volume as an educational work which will amply repay purchase and perusal.

A SYSTEM OF DENTAL SURGERY. By JOHN TOMES, F.R.S., Corresponding Member of the Philadelphia Academy of Natural Sciences, late Dental Surgeon to the Middlesex and Dental Hospitals; and CHARLES S. TOMES, M.A., Lecturer on Dental Anatomy and Physiology, and Assistant Dental Surgeon to the Dental Hospital of London.

Second edition, revised and enlarged. 12mo, 748 pp., with 263 illustrations. Philadelphia: Lindsay & Blakiston. 1873.

Fourteen years have elapsed since the first edition of this volume appeared, and for some time it has been out of print. The announcement of a second edition was greeted with pleasure on both sides of the Atlantic, and the book will be warmly welcomed.

The style of the volume has been changed from octavo to duodecimo, and numerous additions to the text have been more than met by a reduction in the size of the type, so that the bulk of the volume has been lessened instead of increased.

Various sections of the book, including the discussion of neuralgia, dentigerous cysts, odontomes, secondary affections, resulting from the irritation set up by dental disease, etc., are entirely new. Many of the illustrations are also new, and some of these are of special interest. The first third of the volume is devoted, under the heading, "Teething," to a description of the conditions of the teeth and jaws at the time of birth, and to their progressive changes until the temporary teeth have arrived at maturity, including also a consideration of the eruption of the permanent teeth and their irregularities. The succeeding fourth of the book is occupied with a discussion of the histological characters of the dental tissues; to caries and its treatment; and to the materials employed and the methods of filling. A few pages are given to the operation of pivoting, and the balance of the volume treats of dental diseases and accidents. An appendix, covering nineteen pages, is devoted to a summary of the conclusions of the author, based upon recent investigations upon dental caries.

A noticeable modification of the previous edition—a feature which equally marks the last edition of Harris—is the more extended consideration of subjects hitherto considered as outside the sphere of dentistry. The changes which have passed upon the profession within the last decade are but indicative of a growth which is sure to result in making the specialty a profession in something more than a name. The details of dental manipulations, though not to be lightly esteemed, and essential as they are to the completeness of such volumes, are nevertheless insufficient for the growing needs of the practitioner, and hence the necessity that makes the modern text-books systems of oral rather than of dental surgery.

We notice many instances of accord between Mr. Tomes and our latest American text-book upon points which have called out criticism of the latter, as, for instance, the harmlessness of the green deposit found upon certain teeth and upon neuralgia as not a disease *per se*, but a symptom indicative of a lesion *somewhere*. We observe also various conflicting opinions between Mr. Tomes and the volume referred to,—as, for instance, concerning enamel formation and the theory of dental caries; but authorities are still so divided upon these questions, that we can afford to allow each author the widest latitude without criticism. The one thing in which we rejoice is, that such books as these are demanded by the profession, and that the men to write them are furnished by the profession.

OBITUARY.

Died, at Philadelphia, February 2d, 1873, **Elijah M. Neall**, dentist.

Mr. Neall was born in Sussex County, Delaware, September 25th, 1805; came to Philadelphia in 1826; studied dentistry with his uncle, Daniel Neall, an eminent dentist of that period; commenced the practice of his profession in 1840, in Twelfth Street, Philadelphia, and remained in the same locality up to the time of his death. He enjoyed considerable success, and for many years was widely and favorably known in connection with the manufacture and insertion of artificial teeth.

He was a kind-hearted, genial, conscientious man, and will be long remembered by the many whose confidence he secured and maintained without interruption through a long series of years.

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At a meeting of the Middlesex East District Medical Society, held at Woburn, Mass., January 15th, 1873, the special committee appointed by the President, composed of Drs. Cutter, Chapin, and Clough, upon resolutions on the death of Dr. **Edward Gage**, reported the following, which were unanimously adopted:

Whereas, Edward Gage, M.D., late of Paris, has been removed by death, we, his associates and members of the Middlesex East District Medical Society, at our first regular meeting since his decease, cordially unite in the following expressions, and it is

Resolved, That we hereby express our recognition of his distinguished professional character, and our appreciation of his loss; that we regard with admiration those remarkable traits of character which gave him the genius to aspire to, and the ability to fill, a high position in the practice of a difficult and honorable department of surgery alongside of the trained skill of a city long known as one of the great centers of medical learning and mechanics.

Resolved, That to the genial manners of a perfect gentleman Dr. Gage added a brain-power, a mechanical dexterity, and a fidelity of execution, that won him a high place in the esteem and affections of a select clientage; that he ever inculcated a high estimate of the dignity and nobility of the medical profession, honoring it by work that has stood the severe tests of foreign criticism, thus leaving us an example which incites us to renewed fidelity in the discharge of our varied duties to suffering humanity.

Resolved, That we appreciate the encouragement he gave to this organization by his presence and munificent entertainments, and the generous hospitality he so freely dispensed in his adopted home,—ministering to the wants and desires of those (especially of our number) who chanced to visit Europe.

Resolved, That though his last days were clouded with disease, still we look through the cloud and remember him only as when in full health and vigor he adorned his profession, and manifested those qualities of head and heart that stamped him a man of mark and worth.

Resolved, That our Secretary enter these expressions upon our records, communicate them to the family of the deceased, and publish them in the *Middlesex Journal, Boston Medical and Surgical Journal,* and the DENTAL COSMOS.

AZEL AMES, JR., M.D., *Secretary.*

At a meeting of the Alumni of the Philadelphia Dental College, February 28th, 1873, the following preamble and resolutions were adopted:

Whereas, It has pleased the Almighty Ruler to remove from us our worthy brother, Dr. A. J. SNEAD, of the Class 1868–69; therefore,

Resolved, That we, the Alumni, hereby extend to the bereaved family of our departed brother our deepest and most sincere sympathy.

Resolved, That a copy of this preamble and resolutions be forwarded to the family of the deceased; also, that a copy be sent to the DENTAL COSMOS for publication.

(Signed) A. P. MERRILL,
AMBLER TEES,
JAMES MCMANUS,
Committee.

PERISCOPE.

THE PARTY OF THE OTHER PART.—Readers of this journal will hardly need to be told of our earnest opposition to the whole business of diploma-selling. But, on the other hand, we are quite as much inclined to blame the buyers or would-be buyers of degrees. We will venture to say that there is not a single one of the many who have nibbled at the bait thrown out by bogus colleges, or bought their worthless wares, who did not know that in so doing he was a party to a fraud.

The makers of counterfeit money and of counterfeit diplomas would be alike innocent if they had no market upon which to throw their products, nor a public to be deceived and swindled by the uttering of them. The "coiner" must have his "shover," and the seller of the degree *in absentia* must have his ignorant and unqualified customer, who will trade upon the unsuspecting patients or clients who regard his title as genuine.

A recent number of the *British Medical Journal* contains a letter from one who signs himself "A Victim," and confesses that he paid £42 for two degrees, one of M.D. and one of LL.D. The editor justly declines to pity him. He ought to have known that no such proposition could be made in good faith,—that he could not get a certificate of qualification, worth the paper it was written on, without proper study and examination. It is a good thing to break down the traffic in diplomas by closing the bogus schools which issue them; it would be still better to do it, if possible, by dealing with those who are willing to become their patrons, and who are equally parties to the fraud.—*Editorial in Phil. Med. Times.*

THE PROGRESS OF DENTISTRY IN 1872.—* * * * The examination for the dental diploma of the College of Surgeons has been so modified within the past year as to form a stringent test of the candidate's knowledge, and it will be impossible henceforth to deny those who have gone through the necessary well-arranged course of study, and who have obtained the license, the credit due to well-informed members of an honorable profession. That this additional test will not deter candidates from presenting themselves, is sufficiently proved by the considerable number of dental students who have offered themselves for the membership of the College of Surgeons, and for other qualifications.

Turning, now, to foreign countries, we note that to America—always advanced in mechanical skill—we are indebted during the year for the introduction or improvement of exceedingly ingenious labor-saving instruments, designed to facilitate operative manipulations. The "Burring Engines," which have been figured and described in our columns, furnish one good example of these inventions. But it is not only towards mechanical progress that our American professional brethren devote their attention. The highest general and special technical training is recognized as necessary to dental practitioners if they would maintain their equality with the members of kindred professions, and we accordingly find that the oldest and most honorable American universities have been induced to establish special departments for the study of dental science and to confer degrees in dentistry.

We may here appropriately register the act of international amity by which the authorities of Harvard University have signalized the year. They have invited Mr. C. S. Tomes to deliver the address on the occasion of the granting of degrees in dentistry in February next. No higher or more evidently sincere compliment could be conferred upon Mr. Tomes, and, through him, upon English dentists. Mr. Tomes—who has accepted the invitation—will fitly represent our profession. He is a type of the younger practitioners who, by the reforms of fifteen years ago, have been attracted in numbers to dentistry, and who, we are proud to think, combine with complete special knowledge such general culture as would render them distinguished in any profession.

France and most of the nations of the Continent are still without an organized dental profession, and Germany alone during the year has manifested the desire to remedy this state of things. The dental congress at Vienna, in August, initiated a movement which, giving coherence (so to say) to the scattered practitioners of dentistry, must tend towards uniting them in permanent professional union. Dental pathology has recently found its most able exponents among German physiologists, and this work—although not performed actually by dentists—must attract to dentistry students who will recognize in its practice an extensive field for scientific investigation, and not only a mere mechanical handicraft. The institution of a school of dentistry and of a distinctive qualification for dentists, cannot be much longer delayed in Germany.—*Editorial in Monthly Review of Dental Surgery.*

IRREGULARITY OF TEETHING DIAGNOSTIC OF RHACHITIS.—This subject is generally very briefly alluded to in text-books of diseases of children, and generally with the remark that rhachitis is the cause of a delay in the appearance of the teeth. Rhachitis can be hereditary or acquired. It is with the latter class that the author has to do, and it is the most frequent form, affecting nearly one-third of all children. Rhachitis is due to a peculiar disturbance of nutrition in a growing body, a "dystrophy," amenable with more or less success to treatment at the beginning. Children nourished artificially are, for obvious reasons, more liable to it than those brought up at the breast, and the latter, when affected, are generally so after weaning; that is, after the tenth or twelfth month. The disease manifests itself most strikingly in different parts of the bony skeleton, although other parts of the body show traces of insufficient development. For the increase of secretion of the phosphates in the urine in many cases of rhachitis we have at the present day no sufficient explanation, yet we know that the treatment, based upon this symptom, of administering these salts has not proved effectual. The phosphates not only serve for formation of bone, but are also contained in the plastic juices as albumen, fibrin, casein, and, according to Liebig, the insolubility of the form-elements is due to the combination of the matters with phosphate of lime. This explains the richness in phosphates of these plastic exudations, whilst in non-organized exudations they are absent.

More sensitive than the other bones to an insufficient supply of the phosphates are the teeth, analysis showing them to contain 98 per cent. of inorganic matter, of which 88·5 per cent. is phosphate of lime and fluoride of calcium, and 8 per cent. carbonate of lime. The teeth come first in the order of bones affected, and the disturbances, therefore, in the ossification of the teeth can serve as a valuable sign of a very important disease. The formation of the embryo of a tooth commences in the second month of fœtal life, and in the middle of the third month is completed for all the teeth. The milk-teeth are formed in the fifth month, and are so far advanced at birth that the crowns of the incisors and first molars are completely developed; those of the canine and posterior molars one-third formed. As the acquired rhachitis, according to experience, rarely comes on before the end of the sixth month, and most frequently in the latter part of the first year, reaching its highest point between the second and third year, it follows that, if we place the appearance of the first teeth at the seventh month, the rhachitis process will not have had any influence upon these. The only exceptions to this are when a hereditary rhachitis makes rapid progress immediately after birth, or when the infant is weaned very early, and is brought up with improper food; in such cases it happens sometimes that one waits in vain for the appearance of the first teeth and sees a year or more elapse. In the majority of cases rhachitis shows itself first after the breaking through of the first molars. We should be very watchful for the appearance of these latter, and of the following groups. There is a great difference within the limits of health as to the time of their appearance; according to Bednar, it is between the eleventh and seventeenth month, Barthez and Rilliet placing it still later. A child that gets its first teeth at four months will finish teething earlier than one that gets them first at eight months. The early or late appearance of the first incisors often depends upon hereditary peculiarities, and has no signification. The important point is, how great is the interval of time between the appearance of the different groups; for when a child has once begun to teeth it generally preserves a certain regularity.—*L. Fleschmall, in Wiener Med. Wochenschrift.*

EFFECT OF STIMULI ON THE SECRETION OF THE PAROTID GLAND.—Mr. P. Butler Stoney, late Resident Physician in St. Bartholomew's Hospital, relates (*Journal of Anatomy and Physiology*, Nov. 1872) some experiments made by him in a case of parotid fistula. The following were his results: 1. That mastication alone stimulates the flow of saliva from the parotid to a considerable extent. 2. That the effects of taste vary with the sapid substance, sugar having no effect, while tartaric acid acts most powerfully. 3. That sapid substances act equally when applied to the tip and base of the tongue. 4. That the effect of mastication and taste together is much greater than that of mastication alone. 5. That mental stimuli had a considerable effect in one experiment, but in others none at all. These results accord in some respects with those obtained by Schiff in his experiments on dogs, though differing from them in others. This physiologist observed that mastication alone had little or no stimulating action on the parotid secretion in dogs; and Dr. Brunton informs me that he has found this to be the case also in rabbits, while in the experiments above described the action was very distinct. The effect of the application of sugar and tartaric acid to the tongue of dogs was the same as that observed by me. The slight effect of purely mental stimuli in this case is remarkable, as the parotid is stated by Kühne to be readily affected by them, but this may have been due in great measure to the character of the patient, who seemed to be dull and unimaginative. An experiment was also made for the purpose of determining the time required for the absorption of drugs and their excretion by the saliva. For this purpose iodide of potassium was administered, and the saliva constantly tested till it appeared. The time which elapsed between its administration by the mouth and its appearance in the saliva from the parotid duct was found in one experiment to be twenty-nine minutes and thirty seconds.—*Phil. Med. Times.*

VARIATIONS IN WOMEN'S MILK RESULTING FROM INSUFFICIENT FOOD (*London Lancet*, Sept. 1872).—Dr. Decaisne lately reported to the Académie des Sciences the results of his observations on forty-three women who suckled their infants on insufficient food during the siege of Paris. Such women either produced abundant and good milk and their children throve, whilst they themselves became greatly emaciated, or they produced but little milk and that of a bad quality, so that the children throve badly, and for the most part suffered from choleraic diarrhœa; or, lastly, they produced scarcely any milk, and the children died. The following table shows analyses from the three various types:

		Butter.	Casein.	Albumen.	Salts.	Sugar.
1.	Fasting	3·10	0·24	2·20	0·20	6·24
	Well-fed	4·16	1·05	1·15	0·30	7·12
2.	Fasting	2·90	0·18	1·95	0·16	7·05
	Well-fed	5·42	1·15	0·95	0·25	7·05
3.	Fasting	2·95	0·31	2·35	0·31	5·90
	Well-fed	4·10	1·90	1·75	0·31	5·95

It is interesting to notice that the albumen and casein taken together are nearly the same both in the fasting and the well-fed state, though they seem to have an inverse relation to each other.—*Phila. Med. Times.*

THE RECENT DEATH UNDER THE ADMINISTRATION OF NITROUS OXIDE.—Mr. Braine then described the result of a journey he had made to Exeter for the purpose of eliciting the facts connected with the late fatal occurrence there after the administration of nitrous oxide. He had brought back a paper from Mr. Mason, giving an account of the whole matter. The paper stated that Miss Wyndham consulted him on the 22d of January, about the removal of an upper second molar on the left side of the mouth. She was thirty-two years of age, and generally enjoyed good health. There was considerable disorder in the arrangement of the teeth, the second bicuspid on the left side of the upper jaw having what should have been its posterior surface against the lingual surface of the second molar. This tooth had been the subject of so much caries that a probe could be passed right through. The pulp was gone and there was excessive periosteal inflammation It was not possible to remove a second molar with the ordinary forceps without disturbing the bicuspid, so he decided to cut off the crown of the diseased tooth, thus separating the fangs, and then to remove them singly. The patient was accompanied by her usual medical attendant, Dr. Pattinson. The gas was administered in the ordinary way, the patient being seated in a Morrison's chair. The gag used was an ordinary wooden one, and was inserted between the first molar and the second bicuspid. Dr. Pattinson took charge of the pulse in the left wrist. After half a dozen respirations he said the pulse was not so rapid, but its volume had not varied. He then removed the face-piece, and cut off the crown of the tooth with the excise forceps. On his thrusting this instrument into the exposed pulp cavity, and twisting the fang, so much pain was caused that the patient declared she could not bear any further operation unless more gas was administered. On rinsing out her mouth the water was tinged with blood. After an interval of ten minutes, the bleeding having quite ceased, the gag was replaced in its former position. Dr. Pattinson, however, thinks there must have been a minute quantity of blood exuding from the gum at the second inhalation. Mr. Mason took charge of the pulse at the right wrist, Dr. Pattinson again having charge of the left, and gas was again administered. Just before losing consciousness the patient raised her hand and pushed off the inhaler, but it was put back. He then attempted to seize the patient's fang with a pair of stump forceps, but the edge giving way, he dislodged it with an elevator, with which he afterwards easily removed the outer fang. The whole operation lasted about three-quarters of a minute. He received all the fragments of the teeth in his fingers, and felt quite sure nothing passed backward. He then for the first time saw the blueness of the face, but Dr. Pattinson had noticed it before. The symptoms then became alarming; the features appeared puffy and swollen, the eyeballs protruded, the breathing became thick and stertorous. The pulse was not observed. An old attendant, who was in the room, exclaimed, "Take off the gag, she is choking!" It needed great force to separate the jaws, and possibly the gag was then chipped. It was only ten days after the operation that Mr. Braine pointed out for the first time the broken surface of the gag. The head was then thrown forwards to prevent any blood from getting into the throat, and Mr. Mason passed his finger over the tongue to draw it forward. From this time Dr. Pattinson was of opinion that there was fixity of expression, and no further entrance of air into the chest. The window was thrown open, and cold water dashed in the patient's face. Mr. Mason then went for further assistance, while Dr. Pattinson applied strong ammonia to the nostrils, after which he noticed some water lying on her tongue at the back of her mouth. This he caused to run out by drawing the head forward. When Mr. Mason returned with Dr. Drake the countenance of the patient was black, the face swollen, eyes projecting. Dr. Drake put his finger into the throat, and she made three or four expiratory movements accompanied by a slight sound. The pulse continued to beat regularly for two minutes after the expiratory movements had ceased. Two and a quarter hours after death the blueness entirely disappeared. It was much to be regretted that a postmortem examination had not been held.—*Proc. Odontological Society, in British Journal of Dental Science.*

These are the simple facts of this unfortunate case. They teach a serious lesson, as important as painful. Ruthlessly they destroy the infatuation that the administration of nitrous oxide gas is a harmless process,—a process which any man, educated or uneducated, may carry out without danger of destroying life. This lesson must not be forgotten. From no agent have there been so many hair-breadth escapes from death as from this gas; and probably of late some persons every day have been brought within the minutest line of danger to which Miss Wyndham succumbed. Indeed, a leading dentist told us but a few weeks since that he never operated until the breathing had temporarily ceased. But because through all this risk there has been, it is assumed, no fatal accidents, the administration has gone on in contempt of warning and of obvious danger.

The facts teach another lesson bearing on the cause of death. They show clearly that the assertion, so constantly made, that nitrous-oxide gas does not affect the heart is without foundation, for the first symptom presented by Miss Wyndham under the influence of the gas was rapidity of pulse, with diminution of volume But the immediate cause of death was clearly paralysis of respiration. There was no obstruction of the air-passages, and the tongue was protruded from the mouth while she still respired; but as Dr. Drake observed at the inquest, she was as powerless to breathe as though she had been immersed in water.

The most important lesson of all afforded by this painful case is, that we have yet a great deal to learn before we have perfected anæsthesia. Towards such learning the reintroduction of nitrous oxide gas has been a serious check. Nitrous oxide, indeed, is not an anæsthetic at all. A true anæsthetic is an agent which suspends common sensibility without, by any necessity, interfering with those inorganic processes on the continuance of which life depends. Nitrous oxide acts, not in this way, but by suspending for a brief period one of the most important of the organic processes, that of respiration itself. For the reason named, the insensibility produced by the gas is afforded during an interval of partial death. This interval, transient, doubtful, dangerous, may allow an operator time for a short operation, and, the agent away, the suspended function may return. Usually the suspended function does return, more frequently, in truth, than could be expected, but not always, as we now know by lamentable proof.

We cannot conclude this notice without expressing our cordial sympathy with Mr. Browne Mason. We believe the same catastrophe would have occurred whoever had been the administrator of the gas. We feel sure that he did everything that skill, prudence, foresight, and experience could suggest, and we rejoice that the jury was unanimous in their expression of the same sentiment.—*The Lancet.*

Our columns contain this week a report on the recent case of death under nitrous oxide gas at Exeter. The report is accompanied by a letter from Mr. Braine, which, in so far as we are concerned, we insert with pleasure. Neither document in the least degree, by any evidence of fact rendered in it, controverts the position we have taken in respect to this painful accident. In the report, Dr. Pattinson's statement as to the effect of the gas on the pulse is modified from that which he made at the inquest, and on which we commented; but we are inclined to think that his first opinion, given while the facts were fresh on his mind, is, after all, most likely to be correct. The other statements in the report are conclusive of the view that the death occurred from paralysis of the muscles of inspiration. The hypothesis of escape of blood into the glottis is utterly disproved by Mr. Mason's clear evidence; the suspicion that a small portion of the gag got into the glottis and was the cause of suffocation (because ten days after the event a bit of the gag was found to have been broken off it), extreme conjecture as it is, is removed by the truth that the dangerously urgent symptoms appeared while the gag was still firm between the teeth of the patient. In like manner all the other hypotheses as they are examined prove simply untenable. On the other hand, the positive evidences of the immediate cause of death, the continuance of expiratory sounds under the influence of artificial respiration, the dusky, tumid face, the protruding eyeballs—these all indicate, as plainly as symptoms can indicate, that the inspiratory muscles had been rendered suddenly and hopelessly powerless.

We have felt it a duty to deal plainly with the subject under consideration, but we leave it without prejudice. We ask only that there be not too ready an acceptance that what has occurred is from anything else except the true cause of the occurrence. The unmistakable fact is, that the patient would not have died when she died and as she died if nitrous oxide gas had not been administered to her. Mr. Braine, who says she did not die from the effects of the gas, will hardly, we think, dispute this position. We hold that the death, which was clearly caused by arrest of respiration, was the logical sequence of the action of an agent that produces the most perfect possible suspension of respiration. We hold that the fine line between life and death, so often approached under the use of this gas, was this time crossed into death.—*Editorial in The Lancet.*

Since writing my last note on the above subject, our profession and the public have been somewhat startled and alarmed by the sad catastrophe which has so recently happened at Exeter. Whilst deeply regretting an occurrence so untoward, my confidence in the safety of the gas has, thereby, been in no way diminished. But the sad event teaches us a lesson I trust all will learn, that too great care cannot be exercised in the manufacture and administration of the gas.

It has always been my practice to give the gas freely, and in all cases of robust patients, possessing broad and unusually developed chests, I insist upon a bountiful supply, considering an abundance of gas much less likely to cause asphyxia than a small quantity timidly administered. Indeed, it is difficult to imagine a proceeding more likely to be attended with disaster than the accurate application of a closely-fitting face-piece, totally excluding the atmospheric air, without providing, at the same time, an ample substitute to meet the natural requirements of the respiratory organs.

More than a century has elapsed since the discovery of nitrous oxide, and during the whole of that period it has been freely used as laughing gas for the purpose of creating a little scientific amusement, and it must be borne in mind that during its career in that character it was by no means so well understood as at the present time, being imperfectly manufactured, and still more imperfectly administered; yet I have not been able to learn that it was ever suggested that the gas was either suffocating or dangerous. Now, when a knowledge of the gas and its administration has reached a state of almost perfection, I think it to be regretted that any person should come forward and create a feeling of unnecessary alarm in the minds of the public by denouncing it "without either rhyme or reason" as suffocating, dangerous, and no anæsthetic. The number of successful cases recorded prove quite sufficiently that the gas is neither suffocating or dangerous. Also, the mere fact that it has been more frequently given than all the other anæsthetics put together (producing but two fatal results) ought to be regarded as a strong argument in favor of its comparative safety.

If, as has been stated, our patients, when inhaling the gas, are placed on the verge of death, it is wonderful indeed, considering the enormous number who have done so, that only two, in both hemispheres, have as yet toppled over.

Whilst contending for the superiority of nitrous oxide over all other anæsthetics for our specialty, I utterly repudiate any intention of advocating its reckless and indiscriminate use. Experience, judgment, and skill are qualifications that ought to be possessed by all who use it; otherwise success cannot reasonably be looked for.—*Ottley Atkinson, Esq., in British Journal of Dental Science.*

The recent sad death at Exeter coincident with the administration of nitrous oxide for the extraction of a tooth, while demanding from all the greatest sympathy for the friends of the unfortunate patient, cannot but excite in the minds of his professional brethren a deep feeling of regret for the gentleman whose lot it has been to witness such a scene in his surgery. The more the particulars of the case are examined the more it must be felt by all, that at any moment a similar case may befall any one of us in the fulfillment of our professional duties.

The patient apparently in full health and vigor—the operator experienced in the administration of the gas—of acknowledged skill in the use of his instruments—the relative and medical adviser of the patient in attendance—a practitioner of repute on the spot within three minutes of the occurrence—every element of safety apparently present—and yet in a few brief minutes all is sadly over, and by the unfortunate omission of post-mortem examination we are left to vague conjectures as to the cause of death, or bold assertions, which are as unprofessional as they are mischievous. * * * * *

On reading over the evidence delivered at the inquest on this alleged death from nitrous oxide at Exeter, we fail to see *why* nitrous oxide should in this particular instance have been fatal. The second inhalation was not commenced till the patient had recovered from the first three or four inspirations sufficiently to speak rationally. The second inhalation, in view of a difficult operation, was probably pushed further than for an ordinary extraction, but there is no reason to suppose that it was continued beyond the point to which experience shows it can be safely carried. Even if the breathing was temporarily arrested, the fact that it was restored whilst the pulse was strong enough to be felt in the wrist, seems to show that something besides the gas must have caused death; for the recovery of the color of the blood is so immediate on breathing pure air that some return of natural color ought to have been produced. * * * * * *

It is deeply to be regretted that a post-mortem examination was not insisted upon by the coroner. It seems to have been taken for granted that death, following so quickly upon the administration of the gas, must have been caused by it, as no other cause was evident. If heart disease had been diagnosed previously, and no anæsthetic had been given, death would have been attributed to heart disease, but there are various forms of disease of heart and the large vessels which would escape detection if not specially sought for, and the fact of no such disease having been discovered should not have been allowed to satisfy the jury.—*Editorial in British Journal of Dental Science.*

DEATHS FROM CHLOROFORM.—So far as reliable statistics can go, it seems clear that ether is at least eight times as safe as chloroform, or, in other words, that seven out of every eight deaths that are now recorded as occurring from artificial anæsthesia, might be avoided if pure ether were used instead of chloroform. We feel assured that surgeons generally will be disposed to weigh well this important consideration, and that they will not be disposed to conceal its solemn bearings from themselves or from their patients. The fatalities from chloroform have been so numerous, so startling in their various and unexpected character, that the surgeon can hardly see a technically uninformed patient mount upon the operating-table, and submit himself at his bidding to the action of the vapor of chloroform, without asking himself gravely whether he is doing rightly in exposing that person to the excess of danger to life which is involved in the administration of chloroform rather than of ether or of nitrous oxide gas.—*Editorial in British Med. Journal.*

TREATMENT OF EXPOSED PULP. *By T. Charters White, Esq.*—The practice usually adopted in these cases is to destroy the exposed pulp by escharotics, a plan that sometimes terminates in success, but is always attended by a great chance of failure, if not immediately, yet within a very short time. This has led to the alternative of protecting the exposed pulp from the pressure of the stopping by the use of caps of various materials, but as the septic discharges from the diseased pulp were sometimes imprisoned beneath the stopping, thus leading to the loss of the tooth, this plan was looked upon with suspicion, and its adoption fell greatly into disuse; but if the pulp is in a healthy state, and the form of the cavity such as to admit of the edges of the cap having a firm bearing on the solid dentine, no plan is more successful; the tooth remains *alive*, and the patient free from inconvenience.

Of the various materials employed as "caps," none surpass thin plates of vulcanite; its value as a non-conducting medium between the metal-stopping and the sensitive pulp, and the facility with which it can be cut to the shape and size of the cavity to be filled, are among its many advantages. In thus treating an exposed pulp, I believe greater success will be attained than by destroying it, and with it the life of the tooth.

By Charles Stokes.—The practice I pursue in attempting to save the nerve is this: I first (supposing the cavity to be ready for the reception of a filling) take a small piece of the outside covering or skin (which is immediately beneath the shell) of a boiled egg (which is a non-conductor, and very soft), soak it in carbolic acid, and apply it to the exposed nerve, taking great precaution against the slightest pressure upon it. I insert a small quantity of Guillois's cement, and after it has hardened, which is in about a minute, I fill up with gutta-percha, or any temporary stopping. I now request the patient to come back in a week's time, when the gutta-percha filling is taken out, and, providing there has been no pain, I proceed to fill. The failure in the majority of "capping cases" is owing, I believe, to some error at this stage; as very often, in the act of filling and compressing the gold, the Guillois's cement is split, or is forced down, causing pressure upon the nerve, resulting in the total failure of the case. The plan, therefore, I have adopted, and with great success, is to take a piece of "Morgan's plastic gold," larger than the size of the cavity, heat it over the spirit-lamp until it is nearly red-hot; this I place in the cavity, over the Guillois's cement, and gently condense it down with very broad pluggers: by these means I am enabled, with very little pressure, to make a solid adhesive base, upon which I build my filling, and finish in the usual way.

By Henry Sewill, M.R.C.S., L.D.S., Dental Surgeon to the West London Hospital.—In treating these cases, my first care invariably is to ascertain as far as possible the precise pathological condition which is presented,—whether I have before me an irritated, an inflamed, an ulcerated, or a gangrenous pulp. It is only the last of these conditions which decides me at once to extirpate a nerve, for I believe that every other diseased state can usually be cured. A tolerably acurate diagnosis may be usually formed from the history and present symptoms of the case, and from an examination of the carious cavity. The pulp, which is slightly irritated owing to recent exposure, I seal up for a few days, after carefully excavating and washing out the cavity,—a small pellet of cotton-wool, moistened with oil of cloves or solution of morphia, being applied lightly to the exposed surface. Subsequently the nerve is capped, and, if possible, further protected by a layer of osteoplastic cement. In many cases in which slight inflammation exists, similar measures will be often sufficient. Upon the removal of the exciting causes, protection from the pressure of particles of food, and from sudden changes of temperature, the inflammation subsides. If the opening into the pulp cavity is large, and bleeding does not spontaneously occur, great relief may be sometimes afforded by incising the exposed surface with a sharp excavator, and encouraging the hemorrhage by syringing with warm water. No fixed rules can be laid down for the treatment of these cases; each must be dealt with according to its special circumstances. Carbolic acid, with or without an admixture of hydrochlorate of morphia, is one of the most generally useful applications, but the quantity to be employed varies from a mere moistening by means of a pellet of wool to free and repeated swabbings with the strong acid. Mr. Coles's ingenious and rational suggestion, pepsin paste, to digest out the gangrenous portions of exposed pulps, will, I am sure, prove valuable; but, up to the present time, I have had but little experience in its employment. With regard to capping the pulp, my most general practice is to cover the exposed surface with a few folds of gold or tin foil placed in position by the foil-carriers, and carefully fixed so as not to cause pressure, and at once to fill the cavity with "osteoplastic" cement. The foil is used to prevent actual contact of the oxychloride with the pulp, for when this happens acute pain always, and acute inflammation sometimes, is excited. The "osteoplastic" is subsequently cut away to any desired depth, and a gold plug is inserted.

By Oakley Coles, L.D.S.R.C.S., Dental Surgeon to the Hospital for Diseases of the Throat.—If the pulp is covered with a thin layer of softened dentine when excavation of a carious cavity is commenced, and this layer of dentine is by an accident removed, exposing the pulp to view, I immediately cover it over with an oxychloride of zinc cement, leave the tooth alone for a week, to allow of any inflammation that may have arisen to subside, and at the end of that time complete the excavating of the cavity, and insert a stopping suited to the nature of the case, still leaving a cap of osteo over the pulp.

Should inflammation arise, indicated by throbbing pain, I apply a leech near the apex of the fang, and if not relieved by this treatment remove the capping, and dress the pulp with carbolic acid and glycerin.

If a patient appears with the pulp exposed, and partly dissolved away by the purulent discharge consequent on severe inflammation, I then apply pepsin paste to digest away all the tissue that may be either partially or completely disorganized, and having completed this part of the treatment, and syringed out the cavity with a solution of glycerin and carbolic acid, apply the osteoplastic cement to the pulp cavity in immediate contact with the remaining portion of the pulp, and after the interval of a week, should no untoward symptoms have appeared, complete the stopping.

When an exposed pulp is the seat of a dental polypus (Gr. Hypertrophy of the pulp) the pulp may be treated, (1) by compression produced by means of a stopping,* and thus causing death of the nerve; or (2) the polypoid growth may be extirpated with a bistoury, and the pulp afterwards treated with pepsin paste; or (3) the polypus itself may be dissolved away by frequent applications of the same remedial agent.

Where there is a chance of saving the pulp, I always deem it best to do so. Where the general conditions indicate that the pulp must be removed, I prefer to use either carbolic acid, repeatedly applied, or the preparation of pepsin that I have recently brought before the profession.—*Monthly Review of Dental Surgery.*

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* Notes on Dental Pathology. By Oakley Coles. (Churchill.)

Exostosis of Alveolar Ridge.—Sir William Fergusson removed a small exostosis of the left alveolar ridge in a woman who had for some time worn artificial teeth, and who stated that this growth came on her gum in consequence. Sir William removed the growth more to satisfy her own mind and that of her anxious friends than because it was necessary for her health or comfort; although it might have grown larger. With it he removed a portion of the ridge. During the administration of chloroform there was a slight fluttering of the pulse, and it was thought best not to push to perfect anæsthesia.—*King's College Hosp. Report, in Brit. Med. Jour.*

A Case of Fracture.—Mr. Editor: The following report of a case of fracture of the inferior maxilla, treated by me in September last, is given for publication in your journal:

The patient was a boy, eight years of age, in good health at the time of the accident. The fracture was from the kick of a horse. The bone was broken in a line with the socket of the left lateral incisor, this tooth being knocked out at the same time and lost. Not feeling satisfied with any of the various methods adopted in the treatment of similar cases, I made use of the following: I took impressions in wax of both upper and lower jaw; taking the lower one in its out-of-place condition, the posterior portion being drawn up and into about the center of the mouth by action of the muscles. I next took plaster casts from each of these impressions; then sawed the lower one in two at a point corresponding with the line of fracture, and placing these two lower pieces in articulation with the upper cast, being careful to have the teeth fit each other as they did in their normal condition, I fastened these lower parts together by the aid of plaster. A plate of wax was now formed on both the inner and outer surfaces of the teeth, extending as far back as the last tooth on each side, uniting the two plates at the space made vacant by the lost incisor. From this wax plate, as a model, I made a black rubber one. This being done, I placed it in position in the mouth, and reduced the fracture by forcing the lower teeth into position in the plate. The jaws were now closed, a pasteboard boot placed on the chin, and with the aid of a four-tailed bandage, the whole was made secure. Fed the patient on liquid food, there being space enough between the teeth for it to pass. In four weeks I removed the appliance and found I had secured a perfect articulation. —*T. L. Gilmore, in Missouri Dental Journal.*

Devitalized Pulp in a sound incoming Dens Sapientiæ.—In March, 1872, Miss W., aged eighteen, called to have her teeth examined and put in order, at the same time complaining of slight pain in right side of the inferior maxilla.

The six-year molars were filled in their crowns with gold and patient dismissed.

In June she returned saying she had constant trouble with the right six-year molar, and thought the filling the cause.

On examination I found the gum over the incoming right inferior dens sapientiæ puffed up and inflamed.

The lancet was resorted to, giving relief for the time, but three days later she returned with trouble increased.

This time I dissected away the gum so it could not grow together again, and thus impede nature's effort for the eruption.

Three weeks later patient returned suffering intense pain, when I deemed it wise to remove the offender, and did so, to find the tooth occupying a horizontal position in the alveola, with its crown growing squarely against the distal root of the second molar; root considerably absorbed and pulp decomposed. Patient relieved after the extraction. —*D. B. Freeman, in Missouri Dental Journal.*

Observations on Secondary Dentine.—It is well known that as decay of a tooth progresses calcific matter is deposited in the dentinal tubuli opposite the carious portion, and in some cases secondary dentine is formed, projecting into the pulp-chamber, or filling it up altogether in certain dense yellow teeth. Now in our efforts to thoroughly excavate our cavities, do we not sometimes remove the very protection deposited against the advance of caries, and thereby needlessly expose the pulp to sudden thermal changes? How many amalgam fillings have been inserted where the patient intended to have the tooth extracted, but was prevailed upon to have it filled, without any excavation worthy the name, the result being many years of usefulness and comfort in the organ! How frequently teeth are seen in which the decay has been pretty extensive, but two or three of the side walls breaking down, the contents of the cavity were crowded out by the process of mastication, and the decay was arrested without filling, without any noticeable sensitiveness, and the tooth remain useful and comfortable! May we not draw a valuable lesson from such observations?—*E. A. B., in Missouri Dental Journal.*

A Curious Case.—I venture to record the following case which presented itself at the Dental Hospital of London, and which struck me as being, at the least, a unique one.

Ellen Baker, aged two years and ten months, was brought by her mother on January 22d, to have a right lower canine tooth removed for caries. The tooth was removed. In the middle of the same day the mother says the child complained of a "funny tooth in her mouth." On examination the mother found a growth from the spot where the tooth had been removed.

She returned with her next morning and I found a small body which, curiously enough, exactly corresponded in size and shape to the extracted tooth. It seemed to protrude exactly from the center of the gum, at the spot corresponding to the pulp cavity of the extracted tooth. It was of a bluish, vein-like color, not painful, and quite flexible.

I thought, at first, that it must be from a dilatation of the vein or artery, but I suppose it must be considered to be a blood clot, though it possessed a distinctly organized (probably fibrous) external membrane.

Thinking this case may interest some of your readers I have ventured to trespass upon your valuable space.—*Edward Binns, Esq., in British Journal of Dental Science.*

The Microscope.—The dental profession have found the microscope almost indispensable to a right understanding of the diseases of the teeth. This instrument is destined to play a still greater part in future courses of instruction than it has already done in the past.

It is now held that the gravest defects in the minute organization of enamel and dentine are nearly universal.

Too much study cannot be given to the microscopic structure of normal tissues, and to the points wherein defectively organized teeth present differences of structure. To chemistry and the microscope we look for an explanation of many unexplored problems in dental pathology.

To the actual practitioner the microscope cannot but be of very great service. It will be an eye beyond his own, to reveal conditions of which he could never have dreamed but for its aid. The microscope is as important to him who would understand and operate upon living tissues as the telescope to the astronomer. Each instrument reveals a world of its own; both reveal phenomena that would be invisible, and must have remained undiscovered, without its aid.—*Editorial in Dental Register.*

Diagnosis of Neuralgia.—In my last lecture I indicated to you the prominent characteristics of neuralgia, and this affords the bases for diagnosis. Your diagnostic marks, therefore, will be,—

1. The character of the pain in reference to duration. It is either truly and completely intermittent, with intervals of entire ease, or at least with regularly marked periods of abatement, unaccounted for by other corresponding symptoms.
2. The pain is very much more severe than the amount of general constitutional disturbance would seem to justify. In former times, when the nature of nervous diseases was little understood, many a poor sufferer has been condemned by an ignorant doctor as *nervous*, because he complained of pain, and had no fever or dirty tongue, or diarrhœa, etc., to corroborate his complaints.
3. In the vast majority of cases the pain is unilateral, and is limited to particular nerves and their branches. When bilateral it is symmetrical.
4. Fatigue, over-exertion of any kind, but especially of the mind, aggravates the pain.

Recognizing these characteristics or diagnostic marks clearly, you will then look for evidence of,—

1. A neuralgic history, either personal or hereditary.
2. For some peripheral source of irritation, such as a mechanical irritant, a wound, a scar, carious tooth, etc.; the over-exertion of some particular organ, as the eye, for example.
3. For the evidences of some blood-poison, either malarial, rheumatic, or syphilitic.
4. In old cases look for tender points, where the nerves affected emerge from the bones.
5. And lastly, for reflex effects upon the circulation, the vasomotor nerves, upon glandular secretion, or upon nutrition of tissues, or upon motor or sensory nerves, as in local paralyses or anæsthesiæ.—*Walter Hay, M.D., in Chicago Med. Journal.*

Treatment of Neuralgia.—One of the best methods of treating neuralgia is that recommended by Frosseau. A tight top thimble is filled with cotton wool, and a few drops of strong aqua ammonia dropped on it. The open mouth of the thimble is then applied over the seat of pain for a minute or two until the skin is blistered. The skin is then rubbed off, and upon the denuded surface a small quantity of morphia (gr. $\frac{1}{4}$) is applied. This affords almost instant relief. A second application of the morphia, if required, is to be preceded by first rubbing off the new formation that has sprung up over the former blistered surface.—*Medical Archives.*

SENSITIVE DENTINE.—Mr. T. Rogers called the attention of the members to cases where the enamel had been worn off by friction, and the exposed dentine was extremely sensitive. He had tried various plans of treatment, but the only one successful under his hands had been that of making a cavity and filling with gold.

Mr. Harding had found good results from the frequent application of spirits of wine.

Mr. T. Rogers had not tried the frequent application of spirits of wine, but chloride of zinc, antimony, and several other agents had failed in his hands.

The President had always used the remedy spoken of by Mr. Harding, viz., spirits of wine. He had found it very successful in cases where caries had been treated by excision. It gave the exposed dentine, after a time, a hard and polished appearance.

Mr. Coleman had had a case of the kind mentioned by Mr. Rogers that very afternoon, occurring in an upper incisor, and caused by an edge-to-edge bite. The dentine was intensely sensitive, and mischief at the root of the tooth had been set up. He filed away the antagonist tooth, and then directed the patient to apply sal-volatile,—a remedy first pointed out to him by Mr. Cartwright, and employed successfully in the cases named by the President. He often employed it mixed with spirits of wine.

The President said the late Mr. George employed a mixture of equal parts of sal-volatile and eau-de-cologne.—*Proceedings of the Odontological Society of Great Britain.*

THE NATURAL CURE OF DISEASE.—In a lecture delivered before an association of physicians of Brooklyn, Prof. Samuel G. Armor, M.D., says: It is an error very liable to beset the practitioner, to try to meet every different symptom by the addition of another drug to his formulæ. This is sure to lead to excessive medication. Let me guard you against becoming "shot-gun practitioners," on the principle that, if you fire a profusion of shot, it is extraordinary if some do not hit the mark! Quantity and complexity of prescription are very apt to be in proportion to the obscurity of the case. The strong and successful practitioner is usually a man of few remedies.

There are two rules of practice, just in this connection, that I would like to state with emphasis:

1. *Never administer a drug of any potency without a definite purpose,—that is, without a clear indication,—for drugs never occupy neutral ground.*

2. *Never use more medicine than is requisite to produce the effect which is intended, and continue it no longer than is absolutely necessary.*

These rules, faithfully adhered to, cannot fail to lessen the amount of drugs usually administered. It is a wise and true saying, that "it often happens to a *good* physician to find no indications for treatment; to *bad* ones, never."—*Northwestern Medical and Surgical Journal.*

ANODYNE COLLOID.—I beg to send herewith a bottle of a new colloid, which I have prescribed for some time as a topical anodyne application. It has given me very satisfactory results in neuralgia, sciatica, lumbago, all muscular pains, etc. It relieves local pain for the time, and procures a good night's rest, while, of course, the internal treatment appropriate to each case is carried on. I should wish to see its usefulness more extended. It contains—Hydride of amyl, ℥j ; aconitia, gr. j ; veratria, gr. vj ; and ethereal collodion to ℥ij. The amyl, by its rapid volatilization, often produces, almost instantaneously, the desired result ; but, should the pain continue, the alkaloids can be brought into activity by applying a piece of moist spongio-piline over the collodion film. The amyl hydride is the only new ingredient ; but I think the colloid is a clean and elegant preparation.—*M. H. Lackersteen, in British Med. Journ.*

A LOCAL ANÆSTHETIC.—℞. Albumen of Egg, ℥j ; Rhigolene, ʒiv ; Oil of Peppermint, ʒij ; Collodion, Chloroform, āā ʒj. M. Agitate occasionally. Apply by smart friction with the hand, or gently with a camel's-hair pencil along the course of the nerve involved.—*J. Knox Hodge, M.D., in Georgia Med. Companion.*

STYPTIC COLLODION. — ℞. Tannin, ℥ij ; Stronger Alcohol, f℥iv ; Stronger Ether, f℥xij ; Soluble Cotton, ʒj, ℈ij ; Canada Balsam ʒj. Introduce the cotton into a suitable bottle, pour on it two fluid-ounces of alcohol, shake well ; then add ten fluidounces of the ether, agitate frequently until dissolved. Dissolve the tannic acid in a mixture of the remainder of the alcohol and ether, mix with the first liquid, add the balsam, allow to stand until clear ; then pour off.

Collodion with Sesquichloride of Iron.—℞. Sesquichloride of Iron, ℥j ; grs. x; Stronger Alcohol, f℥x ; Stronger Ether, f℥xij ; Soluble Cotton, ʒj ; grs. x. Into a soluble bottle introduce the cotton, pour on two fluidounces of the alcohol, and shake well, then add the ether, and agitate frequently until dissolved. Dissolve the sesquichloride of iron in the balance of the alcohol, mix with the prepared collodion.—*C. H. Mitchell, in Am. Jour. of Pharmacy.*

VERATRUM VIRIDE AS A HÆMOSTATIC.—Dr. J. W. Collin calls the attention of the profession to the veratrum viride as a very powerful and very reliable agent for the arrest of hemorrhage, both active and passive. It should be given in doses of from three to fifteen drops, repeated every one, two, or three hours, according to the urgency of the case, always carefully watching its effects.—*American Practitioner and New Remedies.*

ANTISCORBUTIC GARGLE.—

Take Decoction of yellow bark,	150	parts.
Tincture of myrrh,	8	"
Alcoholate of scurvy-grass,	8	"
Syrup of mulberries,	40	"

Mix.

To be used as a mouth-wash and gargle in scurvy.—*Revue de Thérap. Méd.-Chirurg. and New Remedies.*

ANTI-NEURALGIC PILLS.—

Take of Valerianate of zinc,	0.30	centigr.
Ext. of hyoscyam.,	0.15	"
Ext. of opium,	0.09	"

Conserve of roses q. s. to make 6 pills.

Give two or three, at intervals of three hours, and renew the same medication on the second day for trifacial neuralgia.—*L'Union Méd. and New Remedies.*

DETERSIVE GARGLE.—

Take of	Decoction of cinchona,	150 grms.
	Honey of roses,	30 "
	Chlorhydric acid,	20 to 30 grs.

Mix.

Employed in gangrenous angina.—*L'Union Méd. and New Remedies.*

GUTTA-PERCHA.—One of the beauties and conveniences of gutta-percha will be seen by its application in the following manner: When the gum has shrunken away from a plate, or you have a bad fit generally, cleanse it thoroughly and roughen it a little, then soften a little gutta-percha in hot water and manipulate it neatly over the surface, and while yet warm place it in the patient's mouth and secure a good articulation at the same time you get a good impression. Trim off the surplus, insert in plaster, vulcanize, and finish as usual. The result will be a case as good as new.—*W. N. M., in the Missouri Dental Journal.*

IMPROVEMENT IN BENDING GLASS TUBES.—If the glass tube we desire to bend be filled with *sand*, and each end stopped to prevent its escape on heating over a Bunsen burner, it will be found that the tube may be quite doubled if desired, a perfect curve being produced. In this way we may promptly produce accurate bends of any desired size in tubes of any bore without any previous skill in glass-working. Obviously, the principle depends on a uniform distribution by the sand of the pressure exerted. A similar plan is resorted to by metal-workers in bending tubes of lead.—*A. H. Gallatin, in Journal of Franklin Institute.*

TO FASTEN LEATHER ON METAL.—To fasten leather upon metal, you should first wash the metal with a hot solution of gelatine, and steep the leather previously in a hot infusion of gall-nuts. Then press the leather upon the surface of the metal and allow it to cool, when it will be found to adhere so firmly that it cannot be separated without tearing.—*Boston Journal of Chemistry.*

TO CEMENT WOOD TO GLASS.—Make a solution of isinglass in acetic acid so thick as to be solid when cold. Heat this and apply it. This has been tested by fastening the end of a glass tube to pine wood. The wood gave way sooner than the cement.—*Boston Journal of Chemistry.*

HINTS AND QUERIES.

How shall I treat a tooth in which the pulp is dead, the cavity filled, and a swelling of the face showing the threatening of an abscess?—S. T. S.

ARE the children of this generation becoming more precocious in physical development? I find that most of my little patients, especially the girls, have twenty-eight teeth of the permanent set erupted before they are eleven years of age.—R. P. B.

How shall I remove the discoloration from a tooth, the pulp of which has been removed and the cavity filled with amalgam?—R. P. B.

Who owns patent on porcelain base? and why has it not come into more general use?—M.

Wanted.—Formulas for making and using soft solders for iron, steel, brass, and copper.—Anthony.

Has any one succeeded in mending celluloid rubber plates well with celluloid? If so, how?—J. I.

Reply to "Celluloid."—"How to remove the teeth from an old celluloid plate so as not to injure the teeth." Hold your plate in a strong current of steam from a tea-kettle spout or similar apparatus two or three minutes, and you can pick off the teeth as rapidly and easily as grains of corn from a cob.—N.

Reply to "A. W."—"My nerve extractors fail to extract a pledget of cotton, which I put into the root of a lateral incisor tooth which has abscess. How shall I get it out? or failing to get it out, how shall I treat the abscess?"

The attempt to withdraw cotton from the roots of teeth with nerve extractors is usually vexatious and frequently impracticable, which difficulty will be obviated by the adoption of the following method:

Procure a small-sized watchmaker's broach; make it perfectly soft and flexible, by passing through the flame of an alcohol lamp with a pair of nippers or excising forceps; cut off the sharp point a quarter or half-inch from the end. Be sure that the opening into the pulp canal is as direct as possible, and free from ragged edges; introduce the instrument, and lightly twist it into the cotton by revolving between the thumb and index finger, extracting simultaneously. Success is certain if properly done, unless the cotton has passed through the foramen. With the same instrument, cotton can be passed into the pulp canal by loosely wrapping a lock of cotton upon it, and gently packing and withdrawing alternately; also, by tightly wrapping cotton upon the same instrument and saturating with creasote, it will act as a piston, and by pumping, force the creasote through the external fistulous opening, making the cure a very simple matter in most cases.—G. P., *Columbus, Ga.*

Reply to "Rubber Dam."—Take a piece of fine rubber tubing, cut off a ring one-twelfth of an inch wide, place the ring close down around the neck of the tooth you wish to fill; then fill the cavity in the tooth with cotton, so that the cotton will project and force the rubber ring lower down on the tooth; dismiss your patient for two days, when you will have no trouble in putting the rubber dam where you want it. To keep it there, force small pellets of cotton between the adjoining teeth and the one you want to fill, so that the rubber dam will be forced down on the teeth. Lay small strips of spunk around the tooth; remove the pellets of cotton before you remove the rubber dam.—A Believer.

Reply to "Delaware."—Keep the cavity through which the abscess discharges *open* and free from all deposits; instruct your patient to place a small pellet of cotton in the tooth before eating,—it matters not how small a quantity of food is taken; first fill the cavity in the tooth with cotton,—as soon as done eating, rinse the mouth and remove the cotton; have your patient call every day; examine the tooth, and wash it out with cool water. Be very careful, in examining the tooth, not to allow your instrument to pass through the foramen, or go beyond the apex. After the abscess has ceased to discharge and all soreness has passed away, treat *mildly* with creasote, leaving the entire cavity in the tooth filled with cotton. Continue this treatment until the cotton you have placed in the pulp cavity of the tooth will remain there forty-eight hours without becoming stained. Then fill with cotton, being very careful to get the pulp cavity filled as solid as possible, and allow the tooth to remain in this condition for two weeks, when you may fill the *root* permanently; allow the tooth to rest there for a week or two; then fill the remaining cavity. I believe this treatment will give you and your patient as much satisfaction as any other you may adopt. Be patient during the treatment of alveolar *abscesses.* Be *sure* that your patient comprehends all your directions *and complies with them.*—PENNSYLVANIA.

REPLY TO "C."—"A gentleman, about sixty years of age, came into my office to have some filling done. Upon examination, I found the gums directly over the central incisors presenting a swollen and purplish appearance, and yielding upon pressure a yellowish discharge. The rest of the mouth appeared healthy. The incisors presented no decay, had never ached, but had occasionally been a little sore and a little loose. Is the discharge from ulceration of the roots of those incisors? What is the proper treatment?"

The condition of this patient is one very frequently met with. The vitality of the affected incisors is not equal to the demands of nutrition, hence the susceptibility which renders them occasionally "a little sore and a little loose." Examination of these two teeth would, without doubt, exhibit the dentine of exceeding density and the pulps dead, or otherwise much atrophied. Nature, in her attempts to cast off offending teeth, seems at times only able to accomplish the result through the means of much inflammatory deposit in surrounding parts. The parts overlying are found consolidated and raised up, and if let alone not unfrequently die, and, together with the teeth, are cast as a common slough or sequestrum.

In the treatment of such a case it may, and not unlikely will, prove necessary to the cure to extract the teeth which are the cause of offense; if this, however, for any reason may seem undesirable, then a practice to be pursued consists in cutting down through gums and alveoli upon the roots of the teeth, and the free stimulation of the parts by the use of such washes as capsicum, myrrh, zinc, etc.; such attention, of course, being demanded towards the pulp cavity as the practice of the dentist necessarily makes him familiar with.—G. E.

REPLY TO "P."—"What is the cause of the elongation of a tooth, although it has an antagonist, and there is apparently nothing the matter with it?"

Elongation of a tooth, or, more scientifically speaking, projection from the socket, is a quite common cause of the loss of these organs in old people, as well as in those of younger years, where harmony of relation comes to be outgrown between the organic and inorganic constituents. Teeth loosened and thrown off—no specific offense existing—are always found structurally consolidated; the pulp is atrophied to such extent as to abrogate its nutritive office, while the periosteum undergoes either a species of fatty degeneration, or otherwise an atrophy corresponding with the change in the pulp; rendered thus a foreign body, it is seen that nature pursues but her common office in attempting ejectment.

Where, however, projection is confined to a single tooth, some special source of offense may reasonably be anticipated to exist: thus, cases are on record of bands of rubber having through carelessness been left about the necks of teeth after operations upon them, while the chronic degeneration of the periodonteum as the result of injudicious applications of creasote is not at all of infrequent occurrence. Plugged teeth are occasionally to be found loosened and elongated in their sockets, as a result of particles of metal having been forced into the alveoli, while in the use of the zinc fillings periodonteal death is of common occurrence.—PHILIP.

REPLY TO "O. P."—In nervous irritability dependent on continuous toothache, what is the best treatment?"

Few remedies act better on the languid nervous individual than hydrate of chloral; to prescribe it, the following makes a satisfactory formula:

℞.—Chloral Hydratis, ℥ss;
Syrupi Tolutanis,
Aquæ, āā ℥iij. M.

Dose from two teaspoonfuls to a tablespoonful.

If the pulse be flagging, it is well, however, to precede the exhibition with a glass of wine or other stimulant.

Another and a very admirable plan of treating such irritability is found in the use of the electro-galvanic current. The feet and hands of the patient are to be put in basins of milk-warm water; in the basin holding the feet place the positive pole; in that containing the hands, the negative.

When odontalgia is associated with general vascular disturbance, few remedies act to more advantage than full doses of the bromide of potassium conjoined with veratrum viride: from twenty to sixty grains of the first, dissolved in half a goblet of water, and from three to eight drops of the tincture of the latter. A hot pediluvium, where there is special symptom of head congestion, proves a valuable adjunct.—S. P. G.

REPLANTATION OF TEETH.—I have noticed several articles in the DENTAL COSMOS on replantation of teeth, and having had in my practice two or three cases of similar character, would beg leave to record them.

In the month of October, 1872, a gentleman called at my office to have a tooth extracted. On examination, I found it to be a lateral incisor, built down with gold (as were the other incisors) about the sixteenth of an inch. He stated that hot or cold fluids affected it painfully. My first thought was that the strata of dentine between the gold and the pulp was too thin to prevent the conducting influence of the gold in thermal changes; but after a careful examination I judged it to be ulcerated, and advised its extraction and replacement, as the gums and mucous membrane were in a normal condition. The gentleman was to leave the city the next morning, otherwise I would have advised treating as usual, without removal. After lancing the gum, and extracting carefully, so as to injure the alveolus as little as possible, I removed the sac at the apex of the fang, cleansed the socket with tepid water, replaced the tooth, and tied it with floss-silk to the adjoining teeth, telling him to remove the ligature in about a fortnight. I received a note from him about three weeks afterwards, stating that the tooth felt comfortable, and was fulfilling its natural functions.

In November, 1870 (being then in New York), I replanted a tooth which had been extracted more than an hour. The gentleman had been to another dentist, who, through mistake, had extracted a sound tooth. I replanted the tooth with good result.

In extracting six deciduous loose teeth for a child, the second lateral being attached by the peridental membrane, was brought half-way out of the socket. I replaced it immediately with good result.—HENRY BERHARD, D.D.S., *Milwaukee, Wis.*

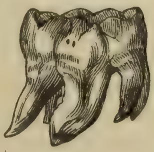
To Remove a Broken Broach from a Nerve Canal.—As inquiries have been made through the Dental Cosmos as to the best method of removing broken nerve broaches from nerve canals, I give one which has never yet failed in my hands when the broach was a *barbed* one. Take a new broach; twist a small lock of cotton loosely upon its point; then pass the broach along the canal until the broken piece is reached; then rotate until the broken piece becomes entangled in the cotton, and now withdraw all together.—J. H. Warner, D.D.S., *Columbus, O.*

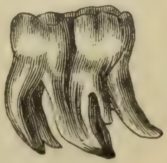
Securing Dental Fillings.—In the December number of the Dental Cosmos, under the head of "Hints and Queries," I notice a reply to "J. T. S.," as to Dr. Mack's claim for securing dental fillings, and would like to say a few words in this connection.

In the spring of 1868 Mr. Biddle made me three wrenches for screwing gold pins into teeth for securing fillings more firmly, and as I have used them with a good deal of advantage, I will describe them.

The instruments are of ordinary octagon excavator steel, formed similar to an excavator, except the end, which is enlarged for one-fourth of an inch in length. A square *wedge-shaped* hole, three-sixteenths of an inch deep, is cut in the end of the enlarged portion, which holds the gold screw while it is adjusted. I use three sizes of these wrenches, which are numbered 1, 2, and 3. The hole in No. 1 is the size of No. 24, English plate gauge; No. 2 is the size of No. 21 gauge; No. 3 is the size of No. 19 gauge. The pins are made of gold wire, the thread being cut on one end the length required. The other end of the pin is filed or hammered square and *wedge-shaped* to fit the wrench. The pins may be cut any length that the case requires. Three drills and three tops of different sizes are necessary to complete the set. During the past five years I have put these pins into from seventy-five to one hundred teeth, and in large approximate cavities I consider them of paramount importance.—W. M. Reynolds, M.D., *New York.*

Connate Teeth.—Some time during the summer of 1872 Miss McK. applied to me to have the second right upper molar extracted. The crown was almost destroyed by caries. I applied the forceps, and without any difficulty extracted the tooth, but to my surprise the adjoining tooth came along. Upon examination, it proved to be a case of perfect union of the dens sapientiæ with the molar. So perfect is the union in this case, both of the crown and fangs, that even Dr. Koecker would no longer doubt the possibility of this now well-established fact were he to see this specimen. The crown of the molar is almost destroyed by caries, whilst that of the dens sapientiæ is almost untouched. The union is as perfect in the enamel as in the roots. The specimen shows four separate roots, and one composed of three others perfectly fused together. The cut gives a good idea of the appearance of this anomaly.—J. R.





"The Age of Improvement."—In the February number of the Dental Cosmos, department of "Hints and Queries," and under the above title, the writer indulges in some very sweeping remarks, reflecting *especially* upon the originality of invention in Mack's retaining screws and instruments. He also indulges in some reflections upon those "*teachers in the profession*" who have indorsed these late inventions as "an advance in the right direction." To prove that these "teachers in the profession" do *not* "ignore" Dr. Dwinelle's teachings, we would refer him to a communication from one of these gentlemen, Dr. C. E. Francis, in the October number of the *Missouri Dental Journal.* Dr. Dwinelle's theory of the use of a screw with a "head having the appearance of an inverted cone," in which a slat is cut across, is good as far as it goes, but it fails from want of *convenience of application.*

Mack's screws, by their *original* and *peculiar shape*, and being adapted to the instrument (which is a part of the invention) designed to carry and conduct them through small apertures, where they may be readily secured and left if necessary beneath the marginal walls of the cavity, thus avoiding the need of excising the wire, are a convenience in thousands of cases in which headed screws could not be used. This is also true with regard to their use in inferior incisors or superior laterals, and other cases too numerous to mention.—C.

Toothache Mixture.—The following mixture I have used for some time with the best results in toothache of children and adults. The mixture so combined is active, yet of an agreeable taste.

℞.—Camphor,
Creasote,
Carbolic Acid, āā ℥i;
Sulph. Ether, ℥iss;
Chloroform, ℥ij;
Sandarac Gum, ℥i;
Sydenham's Laudanum, ʒij;
Oil of Cloves, ʒj.

Mix first the camphor, carbolic acid, and creasote till all the camphor is dissolved, and set aside. Next mix separately sulph. ether and sandarac gum, forming a thick varnish when all the sandarac is dissolved; strain quickly through fine linen, avoiding all possible evaporation; mix with this varnish the laudanum, chloroform, the first mixture (camphor, carbolic acid, and creasote), and add lastly the oil of cloves. Keep well corked for use. Clean and dry perfectly the cavity, and drop one or two drops of the mixture into the cavity of the tooth, covering with a pledget of cotton. If relief is not obtained in a few minutes, repeat as before.—M. Trujillo, D.D.S.

I have been very successful with the use of permanganate of potassa as a local styptic. I use forty grains to the ounce of water.—R. P. B.

Before casting dental plates of Walker's or Weston's metal, brush pins and inside of blocks with the following solution: zinc dissolved in hydrochloric acid, which will cause the metal to firmly adhere to both blocks and pins.—F. E. Coomes.

A bill has been presented to the Legislature of this State relative to regulating the practice of dentistry. Would it not be advisable to call a convention of dentists for the purpose of forwarding the same? If we do not show a desire for such a law, we cannot expect our representatives to be interested.—Sub.

THE

DENTAL COSMOS.

VOL. XV. PHILADELPHIA, JUNE, 1873. No. 6.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,
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[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S., in the Office of the Librarian of Congress at Washington.]

(Continued from page 231.)

DURING the *eighth* year the superior lateral incisors usually follow as next in order of eruption, and an examination of the same "preparation" which has been referred to when speaking of the inferior laterals will show their position in the superior jaw to be anterior to the centrals. From this fact, the placing in a proper position of superior centrals which have presented abnormally within their normal circle will frequently insure a correct eruption of laterals, as these are apt either to be forced into better position by the correction of the first irregularity, or, if not, will subsequently "follow," as it is termed in the technical phraseology of orthodontia. If such is not the case, and the permanent laterals are found behind the deciduous laterals, these should immediately be extracted, and thus much be done for the present toward attaining the desired object; subsequently, when the laterals are sufficiently erupted, as in analogous cases pertaining to the lower jaw, traction may be employed, and the effort made to place these teeth exterior to the lower teeth; *but very frequently* (in my practice decidedly most frequently) *in these cases the traction is not to be made upon the superior laterals, but upon the inferior laterals, even though these teeth be in correct alignment.* The object to be desired at this time is not so much the placing of the teeth in precisely the positions which they are eventually to occupy, as it is to merely *place the four superior teeth anterior to the four inferior*, for this is *all* that is absolutely necessary to insure a proper alignment in the future. It will readily be seen that this is much more easily accomplished by using the molars (either temporary or permanent) of the lower jaw as means for attachment, and thus drawing the lower teeth inwardly, than would be the attachment of bars and use of ligatures, or the passing of rubber bands exteriorly to the centrals, for the purpose of drawing the superior laterals outwardly. I would refer here incidentally to "inclined planes," as they are sometimes successfully employed for the purpose of correcting this presentation of superior laterals; but I well know that they are by no means universally regarded with favor either by practitioners or patients, and, with a tolerably extensive experience in the treatment of irregularity arising almost exclusively from premature loss of deciduous teeth, I have not been obliged to have recourse to this appliance for the past twelve or fifteen years. As in the case of mal-presentation of inferior laterals, so, in instances of mal-presentation of superior laterals, the deciduous cuspids should *never* be extracted to "make room," but if the pathological arrangement is found to be such as to preclude the probable success of the efforts suggested, everything should be left untouched until the temporary cuspids are about being replaced by the permanent cuspids; then, after the exfoliation of the deciduous cuspids, a properly directed effort will generally insure, with ease, a desirable consummation. When upon the period of eruption of the deciduous superior laterals, I mentioned the great deviation in regard to this, which pertains peculiarly to these teeth, as the first of the many pathological peculiarities which will be found to be their distinction through life; and we have now arrived at the second great abnormality, which is not infrequent absolute absence of germs. It is *not* a very unusual thing to find these teeth wanting, and it *is* a very unusual thing to find any other teeth which do not, sooner or later, make their appearance. When this absence of laterals occurs, the centrals are generally safely, though not unduly, separated, and the permanent cuspids usually fill sufficiently the space between the centrals and the first bicuspids. This juxtaposition of the cuspids, however, gives a peculiar expression, which it is advisable during young adult life should be modified by removing, from time to time, a portion of the cusps of the cuspids. This, in a few years, gives to the cuspids an approach to the shape of the cutting edges of the laterals, and the first bicuspids present very well that cuspid shape which in the proper position of cuspids adds so much to the beauty of a denture. During the passing of the *ninth* or *tenth* year of life, the first attempt at restoration of space for proper dental alignment is found to be taking place in the loosening of the first temporary molars both inferior and superior. These, in due time, are replaced by the first bicuspids of the permanent set, which, though decidedly larger than the second bicuspids, are nevertheless smaller than the first deciduous molars. As these first bicuspids gradually erupt, the deciduous cuspids are pressed by the natural tendency of the permanent laterals into such position upon the alveolar ridge as to permit the somewhat more correct placing of all the permanent incisors, which in addition to their own inclination in this direction derive much of their power for the final accomplishment of this purpose from the steady pressure of the tongue as it rests against the hard palate, and from the employment of the same organ in its manipulation of food during mastication. Abnormalities of presentation pertaining to bicuspids are almost confined to their erupting internally or externally to their respective deciduous molars, although sometimes they are found in positions quite distant (comparatively) from a normal position. Ordinarily, however, in cases of mal-position of these teeth it is sufficient to extract the covering temporary molar, which should be done unhesitatingly; and a proper position is usually soon assumed by the coming bicuspid without other extraneous directing influence than that afforded by the tongue and cheeks. In this place it becomes proper to call attention to the danger to this permanent denture which exists in connection with the *premature* extraction of the deciduous molars. By referring again to the "preparation" of the jaws of six or seven years of age, it will be noticed, particularly, in the lower jaw, that the developing bicuspids are clasped within the encircling roots of the deciduous molars, and it is from this circumstance that the amount of mechanical violence done to the parts in the premature extraction of these molars is frequently sufficient to interfere seriously with the development of the bicuspids, and sometimes sufficient to destroy the vitality of the germ, and thus rob the patient of a permanent tooth. At about the *tenth* or *eleventh* year the grandest compensation for encroachment is made by the shedding of the second temporary molars and their replacement with the second bicuspids of the permanent set. In this exchange we have the largest of the deciduous teeth removed, and almost the smallest (none except the laterals competing in this respect) of the permanent teeth taking their place. We now find the advantage of that "inclination" of the teeth which causes the incisors and cuspids to move, if permitted, *from* the mesial line, in opposition to the inclination of the bicuspids and molars to move *toward* the mesial line. If from the permanent teeth we extract a first bicuspid, the space is found in time to be completely occupied by a general separation (slight) of the incisors and cuspids, and a moving toward the center (decided) of the bicuspids and molars. If we extract a second bicuspid, the space is filled almost exclusively by the approach toward the center of the molars. If we extract a first molar, the second permanent molar moves centerward, and inclines toward the center; and if we extract a second molar, the wisdom tooth, if not present above the gum, erupts in the place of the second molar; and if present, almost always tips in its effort to advance toward the mesial line. If, however, we extract a cuspid, it is almost universally the case that separation of the incisors occurs, and at the mesial line, and in a degree which is unpleasant, and sometimes even deforming.

From this knowledge we recognize that, upon the removal of the first deciduous molar, the space gained by the relative smallness of the bicuspid is appropriated unevenly by the natural tendency of three teeth,—cuspid, lateral, and central of either side,—and this urged by the influence of the tongue in opposition to the unaided tendency of the first permanent molar and almost-absorbed second deciduous molar. This gives us about the space of half the width of the permanent cuspid, in addition to that which was before possessed by the permanent incisors, and enables these teeth to approximate a proper alignment so closely that by the time which we have now reached—at which, as I have said, the greatest provision for future perfection is made—we find that upon the removal of the crown of the second temporary molar, the space gained by the very great relative decrease in size of the second bicuspid is again unevenly appropriated by the final efforts at obtaining position on the part of the incisors, the continued and now important effort on the part of the growing permanent cuspid, and the natural tendency of both bicuspids to occupy their *proper* position in the dental arch, in which position they permit sufficient space for the correct arrangement of the entire permanent set, and toward which position they tend, *provided* that all the various changes in dental development have been permitted to progress without unnecessary interference. At this time we have in position all the permanent teeth which occupy place anteriorly to the "sixth-year molar" except the cuspids, and it is next in normal order that the *second permanent molars,* inferior and superior, should now erupt. This usually occurs during the eleventh or twelfth year of life, and, like the eruption of the first permanent molars, is generally attended with little or no inconvenience. The deviation from this is seldom excessive, and indeed is even, in slight degree, infrequent. It will be remembered that these teeth erupt slowly; that there is no complication of covering teeth, and therefore no removal necessitated; that there is a sufficiency of other cutting and masticating surface which is completely unirritated; that the positions of the coming teeth are such as to almost positively preclude accidental wounding during mastication; that there is abundance of space for their eruption, and it will therefore be recognized as reasonable to expect that these teeth would be comfortably placed in position. It must be stated, however, that lancing is sometimes required to relieve suffering, even from the second permanent molars, and that concomitant with their eruption we occasionally find systemic complication; but this, in my experience, has been almost universally in the form of aggravation of existing trouble, rather than to be regarded as a positive excitant. Thus, if the child of twelve is suffering from any other exhausting disease, the additional irritation of dentition is sometimes very serious, and should always be promptly and thoroughly relieved.

We have now reached a period of life *at which* will be most satisfactorily demonstrated the wisdom of having pursued such practice as I have laid down for the guidance of dentition; and we have also reached that period *up to which* the most pernicious methods of practice, in the direction of premature and injudicious extraction, with its false basis of "room-making," has also been productive of apparently highly-gratifying results; but it will, at this time, be found that, *as the result of extraction*, we have a beautifully regular denture, *with no room for the now-presenting cuspids*, which are thus forced to erupt low down inferiorly and high up superiorly, either exteriorly in the form of "tushes," as these maltreated cuspids are then termed, or interiorly through the hard palate or within the circle of the lower teeth. This is the irreparable wrong which is done when the deciduous cuspids are extracted, and it is for this reason that I have had italicised, upon a previous page, the warning in relation to it. This is one of the few *very bad* dental operations which are within the list of those that the most unskillful can do so thoroughly that the most skillful cannot, in the least, remedy. It is for this reason that it becomes a serious thing from the first view of the matter.

But there is another consideration which peculiarly forbids the extraction of the cuspids, and which rather points to the advisability of constantly rendering especial service in their direction. This is the comparative uncertainty of the period of eruption of the permanent cuspids. The *twelfth* or *thirteenth* year of life is the time which is regarded as normal for the cutting of these teeth; but the deviations from normal, in connection with cuspids, are only excelled in frequency and extent by those of the third permanent molars—wisdom teeth. I have several patients who retain their deciduous cuspids at the age of twenty years; one who retains the right superior deciduous cuspid at the age of twenty-six, and a portion of the *space* (!) which was made some three years since by the extraction of the left superior deciduous cuspid at the hands of a gentleman who thought the prominence over the tooth indicated the immediate coming of the permanent cuspid, although the deciduous cuspid was perfectly firm; another who retains both superior deciduous cuspids at thirty years of age,—both of them largely filled; and still another who erupted her left superior cuspid at the age of fifty-five, never having had a cuspid in position there previously, and after having had the roots of all the other superior permanent teeth extracted, and having worn an upper artificial denture for several years.

Thus we find that, unlike the permanent teeth before spoken of, in relation to which we seldom find a greater deviation of eruption than two or three years, with the cuspids we can never know the extent of deviation until each particular case has pronounced for itself. It is therefore good practice to refrain from removing the deciduous cuspids until their permanent successors have actually presented abnormally, and have thus given some guarantee of their reasonably immediate complete eruption, when it will almost invariably be found that upon the removal of the deciduous tooth the permanent one will assume a proper position with a degree of promptness in consonance with the more or less advanced age of the patient, and the greater or less density of the various tissues.

(To be continued.)

DIAGNOSIS IN NEURALGIA.

BY JAMES E. GARRETSON, M.D., PHILADELPHIA, PA.

In no one subject of medical study is a practitioner more likely to find himself not only profoundly interested, but as well, unfortunately, over and again confused and confounded, than in this which forms the subject of present consideration.

A cardinal point in the appreciation of painful nerves would seem to lie in viewing the condition not *in abstracto*, but as expressive of lesions, the discovery and removal of which constitutes the true principle of diagnosis and treatment: in other words, pain-giving nerves are not necessarily pathological in themselves, but are instruments of speech to pain-producing causes associated with them.

It is to be suggested as a most reliable rule in medical practice "that, whenever a patient presents himself with a complaint, no matter what may be the character of the lesion, where, or how situated, the trouble has its origin in the presence, directly or indirectly, of some agent of irritation." If, then, such be a solid premise, what inference so natural and so sensible as that the cure of a disease lies in the discovery and removal of a cause inducing it? And in so simple a premise lies the whole lesson of the neuralgiæ,—*i.e.* neuralgia is pain in a nerve; pain is an expression of irritation; irritation depends on the presence of an irritant; the removal of the irritant must be the relief from the irritation; the relief from irritation must be cure of the pain which is its expression.

Passing from such foundation principles to the study of neuralgia faciei, a practitioner is to understand and consider not only the anatomy and physiology of the fifth, but as well of neighboring nerves,—indeed, of the nervous system at large. Because, however, neuralgia of the trigeminus is found most frequently associated with the direct relations of this nerve alone, study of a case here most naturally commences; and further, because it is found the case that the great majority of the neuralgiæ of the trifacial are true odontalgiæ, the lesions of the teeth take precedence in the search after the cause.

In a search for an odonto-neuralgic lesion, seven expressions force themselves for recognition:

1st. Sensitive dentine.
2d. Direct or indirect exposure of the pulp to sources of irritation.
3d. A diseased state of the periodonteum.
4th. Confinement of pus and gas in a pulp-cavity.
5th. Granules of osteo-dentine in the pulp.
6th. Sympathy.
7th. Recession and absorption of the gum and alveolus.

These seven lesions have been presented and studied to the best of the writer's understanding in his "System of Oral Surgery," and he might, therefore, be scarcely justified in consuming pages in the present article by a repetition, having in such direction nothing new to offer.

The neuralgiæ, save in certain exceptional cases, are diagnosable through the process known as exclusion, a process of reasoning which explains the character of a condition by demonstrating what it is not. Thus, as an example, a facial neuralgia is known not to be an odontalgia, when the knowledge of the practitioner,—being sufficient to the end,—satisfies as to the absence of tooth lesions.

Diagnosis by exclusion being, therefore, the common method demanded, it is perceived that the study of the neuralgiæ covers and embraces the field of medicine at large.

Conjunctions of conditions are there, which frequently demand consideration. Thus cases are to be met with where a relief afforded in one direction is equal to the cure of the expression of the other. Many and marked examples are to be met with in this direction.

The most frequent and common of such conjunctions exist between diseased teeth, syphilis, and rheumatoid congestions.

Still another, and, in malarious districts, a common association, is the conjunction of the miasmatic with local diseases, or with some other of the poisonous blood crasis.

Habit, in association with local lesion, is a matter compelling consideration. Thus, in much brain-work is found nervous exhaustion: hence students are frequent sufferers from nerve troubles,—from odontalgia, and other neuralgiæ, the true conception of such cases lying in the appreciation of the condition as of asthenic expression.

Tobacco, in its too free use, furnishes another of the asthenic habits. Venery is still another very common association; also the menstrual irregularities, ulcers of os, and cervix of the uterus, these wearing out, or exhausting, force, as the result of continuous irritation.

Syphilis as a cause, or as a conjunction, finds diagnosis in a special history; or, if this is denied, then phenomena are to be accepted. It is not uncommon in clinical practice to find an obscure neuralgia worse at night when the patient is warmly covered in bed, than during the day; no history to be procured, yet with evidences, more or less expressive, of the vice being present. Exhausting common causes,—in a case of this kind,—in a search after a diagnosis, it is commonly found that in anti-venereal treatment lies the relief of the pain.

Rheumatism, particularly in winter practice, is found a common conjunction and independent cause of neuralgia. Cases enough have come under the immediate observation of the author when not a single general evidence of this disease was present, but yet where diagnosis by exclusion settled on this as a cause, and where treatment, so directed, has quickly afforded a cure. Examples of this relation, the most impressive, are found where a conclusion as to the cause of an odontalgia wavers between the blood-poison and pulp-nodules, the question finding settlement in the anti-rheumatic treatment, resorted to as a test.

In reply to a question very often asked, as to "whether all cases of facial neuralgia are diagnosable," it might be answered that all are, to a *knowledge* sufficient to the comprehension of all the causes; but the writer has certainly met with many cases in which no information at his command was able to the exposition. It is to be impressed, however, that he who is the most learned in the general causes will go the farthest in the search, and, where his explorations fail in making a discovery, he is not entirely unjustified in concluding the lesion to be of a nature or of a situation beyond the reach of remedial means; thus numberless are the cases where exostoses about the transmitting foramina have been shown by *post-mortem* examinations to have been the cause of trouble; while still again, organic brain-lesions have been demonstrated through similar *exposés* to be the fault.

Climatic influences frequently come into the account. Thus, as in asthma, a person grievously afflicted in one location may be entirely free of pain in another, marked examples in this direction being often met with in changes from a seaside residence to one inland, and *vice versa*. Even, indeed, are influences of this nature at times to be seen as the floors of a house are concerned, a patient being the better the higher the sleeping-room. Here it is not to be decided that the real offense lies in the atmospheric influences just changed. The predisposing lesion may be a bad tooth or other such cause; but that which has been changed is to be viewed as a second source of irritation, the system being very well able to resist or antagonise the one, but not the two offenses in their conjunction.

GOLD CROWNS—PORCELAIN FACE.

BY M. H. WEBB, D.D.S., LANCASTER, PA.

VARIOUS modes of placing porcelain crowns on roots of teeth by "pivoting" are practiced; yet a modification of the method first adopted in building a crown of gold with a porcelain face upon the root of a tooth, and also the manner of permanently inserting the same character of a crown without a plate or clasp, and where no root remains, will only here be submitted. The difficulty of introducing and consolidating foil in some parts around the gold backing which was attached to the porcelain and extended into the root (described in the DENTAL COSMOS for November, 1872) suggested the following modifications, which have been successfully adopted in several cases since that time.

When the porcelain face is prepared, a canula long enough to embrace the platinum pins is fitted to a wire made of platinum gold, of sufficient length to extend through the canula and well up into the root. Before the edges of the plate, brought into apposition when forming the canula, are united by solder, they should be so opened as to allow riveting on the inner side to the platinum pins. The canula is then reclosed, and the whole, encased in a suitable matrix, carefully heated and soldered. The solder should also be made to flow around the pins. The wire should be made to fit in the canula along its whole length, and, with the exception of the part contained in the canula, the surface of both wire and canula should be roughened so that the gold when impacted may the more firmly retain them.

When all is in readiness for the performance of the operation, the rubber-dam—or, if this cannot be applied, a metallic coffer-dam fitted to embrace the root—should be adjusted. This gold or silver dam serves a good purpose as a matrix, and may be used in connection with, and to assist in retaining, the rubber-dam. It is removed previous to filling the space between the porcelain and labial margin of the root by cutting it at one or more points with a corundum disk, a bur or file. The wire is then inserted in the canula, and the whole so adapted that the porcelain will be within about a half-line of the root. Having held it in position until sufficient foil is packed about the wire to hold it quite firmly, the porcelain face is removed, so that the part around the wire can be more readily filled to the margin of the root.

The extent of caries is usually too great to allow the insertion of the wire by a thread along the whole length of the pulp-cavity, yet it may be so inserted, to a certain degree, in nearly all cases; the manipulation, under such circumstances, being similar to that of securing a gold tube in a root by a thread a portion of the length, and then filling the remainder with gold, as described by Dr. Wm. H. Dwinelle in the

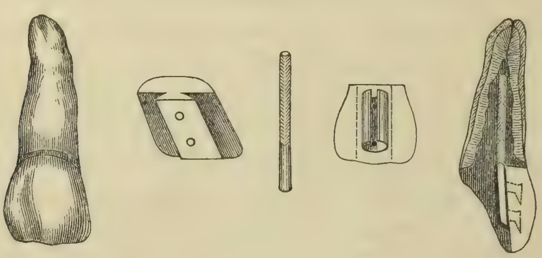
April number of the *American Journal of Dental Science* for 1855. His object was the insertion of a crown by a "pivot" to fit in the tube.

When the root is filled and the wire thus secured, the porcelain face is replaced and the filling proceeded with,—covering the margin of the root surrounding the canula, and into the grooves along the sides of the porcelain. This latter, upon the principle known in mechanics as "dove-tailing," assists to retain the porcelain in position ; indeed, upon solidly impacting gold into these grooves greatly depends the permanency of the operation.

When all this is accomplished, the space between the porcelain and the root is filled from the labial surface ; and in this, as well as throughout the whole operation, the foil should be solidly impacted, fully built out with the outlines of the root and porcelain, and the original contour restored.

The pulp cavity should, of course, be filled to the apicial foramen.*

Diagram No. 1.



This operation, *well performed,* is more permanent than those known as "pivoting," and is desirable where the means of the patient will allow. It is permanent, because the crown is replaced by one of gold, which covers the exposed edge of dentine and cementum.

The insertion of a porcelain tooth without a plate or clasps, and where no root remains, is an operation less difficult than those described, much more satisfactory than the usual method, and, where the remaining teeth are firm in their sockets, may be considered permanent when inserted as here illustrated. About two years ago an operation somewhat of this character was described in the Dental Cosmos by Dr. B. J. Bing, then practicing in Paris, now in London.

A patient who disliked the wearing of a plate, and desired something different, presented, when the operation now to be described was decided upon and performed. After forming appropriate cavities in the proximate surfaces of the teeth next the space left from the loss of the natural tooth, an impression was taken and a plain porcelain tooth selected, fitted to the parts and backed with gold,—a portion of the backing extending from each side about one and a half lines, for insertion into the cavities prepared for them in the adjoining teeth. A small gold plate was then formed to fit upon the gum, covering as much of it as would embrace the neck of the natural tooth were it in position. The backing when riveted to the porcelain was then adapted to the position in which it was to be placed, and while the whole rested on the small plate upon the gum, the backing and plate were so secured by a cement that they could be removed intact, and after the usual preparation soldered. The surface of the extended sides of the backing was roughened, so that the gold would better secure them when filled into every part.

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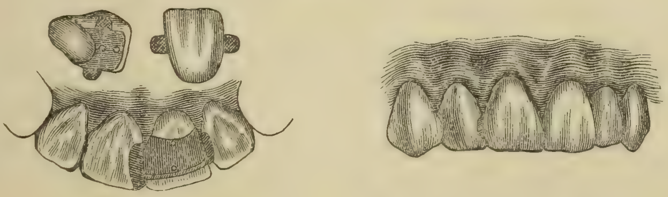
* The filling should have been more distinctly illustrated in the cut.

This being done, a thin piece of rubber coffer-dam was placed on the adjoining teeth and over the gum upon which the porcelain, with the gold attachments, was to rest. The rubber occupies but little space, and, when ligated to the teeth adjoining, so presses up the gum that its thickness is more than compensated for. The porcelain, with its attachments, was then placed in position, and secured firmly by the solid impactation of small pieces of light cohesive gold-foil around that portion of the plate extending into the cavities.

Diagram No. 2.



The parts when in position appear as here illustrated, the gold backing and fillings showing plainly on the palatine surface, while on the labial no gold is exposed to view, excepting a small portion of the filling in the lateral incisor. The porcelain and gold attachments as prepared for insertion are also shown. By reference to the same diagram, it will be seen that the cavity in the central incisor was formed to the cutting edge of the tooth. This was done to gain access to both sides of the plate extended into the cavity, which could not otherwise be done unless a portion of the labial surface were cut away, which would have been objectionable in consequence of the exposure of gold. In the lateral incisor this was deemed necessary, because being smaller than the other, it was thought best not to cut it away in the same manner. It was so arranged, however, that though the filling can be seen, it is not conspicuous.

THE BEARING OF THE DEVELOPMENT OF THE JAWS ON IRREGULARITIES.*

(Remarks addressed to the Alumni Association of the Philadelphia Dental College, Feb. 28, 1873.)

BY CHARLES S. TOMES, M.A., M.R.C.S., LONDON, ENGLAND.

Gentlemen,—Having only last night been requested to say a few words before you, it has of course been impossible for me to prepare a paper, nor can I hope, without preparation, to say much that is not already perfectly familiar.

However, shortly before my departure from England, I had the good fortune to see a case which has considerable practical interest, and at the same time serves to illustrate certain points in the development of the jaw which are hardly sufficiently kept in mind by the practitioners of our specialty. I propose thus to relate this case, prefacing it by some remarks on the manner of development of the jaw,—a matter which is so frequently lost sight of in the treatment of irregularities.

If we take a jaw, selecting the lower, as being, from its isolated position, more easy to study than the upper, and draw along it an imaginary horizontal line a little below the level of the mental foramen, we shall have divided it into two portions, the life histories of which differ very markedly.

Below the line we have a jaw, the functions of which might be briefly described as "muscular"—that is to say, it gives support to muscles and other soft parts concerned in such operations as mastication, deglutition, speech, and respiration; whilst above the line we have the "alveolar" portion—that is to say, a bone subservient to the development and subsequent fixation of the teeth.

In the history of their development, these two portions contrast very strongly, the lower or muscular portion possessing a permanency and constancy that is in no way shared by the alveolar borders.

In the young fœtus, that which lies below the line can hardly be said to exist; and this is fully accounted for by the fact that, inasmuch as the functions of deglutition, respiration, etc., are not as yet performed, there is no need of a strong bony bar to give a *point d'appui* for muscular action. But immediately before, and for a considerable period after birth, the growth of this part of the maxillæ goes on with great rapidity, so that, by the time the child has attained the age of eight or nine years, it has attained to dimensions (as far as depth is concerned) nearly approaching those of an adult. And once having been deposited, there the bone persistently remains, only wasting slightly in old age, when the loss of the teeth has entailed a diminution in the activity of the muscles attached to it.

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* At the time when the above remarks were made, I had not seen Dr. Isaiah Forbes's paper on "Irregularities," which appeared in the *Missouri Journal* for February, in which that author, though using a different line of argument, has arrived at substantially the same conclusion.

If we now direct our attention to the life history of that which lies above our line, we shall find it to be much more varied. In the early fœtus, where the principal, one might almost say the only, function discharged by the maxillæ is the protection of the developing teeth, we find the jaw to consist almost wholly of this, to the exclusion of the other portion. It grows up in relation to the temporary teeth, and, when the period for their eruption arrives, is in great part removed by absorption to allow them to escape from their cysts. Then deposition preponderates over absorption, and bone is built up around the necks and roots of the temporary teeth. Again, when the period arrives for the permanent teeth to come down, the "alveolar" portion is once more destroyed, the teeth are erupted, and then *new* bone deposited around their necks and roots.

Thus, in the sockets of the permanent teeth there probably does not exist one morsel of bone which had ever formed a part of the alveolar supports of the temporary teeth; that has been all, or for all practical purposes all, removed by absorption. Now the contrast to which I have alluded as existing between the life histories of these two portions of the jaw is this: the one (below the line) is steadily progressive in its development; when once formed, it is never removed, and its development is wholly independent of the teeth, or, to speak with absolute precision, is dependent on the teeth only in so far as they are accessories to the act of mastication; whilst the other (above the line) has been formed and removed, over and over again, so that it has some of that stability and fixity which belongs to the lower half of the jaw. In fact, it is wholly subservient to the teeth, and when these are lost in old age it entirely disappears.

And the point to which I am coming, and upon which it is impossible to insist too strongly, is this: teeth when they are erupted *do not come down and take their places in a bone already prepared for them;* on the contrary, that which is there to start with is absorbed, and the bone in which they are ultimately implanted is built up *around them, no matter what position they may assume subsequently to their eruption.* And the inference to be drawn from these facts is tolerably obvious: namely, that premature extraction of the temporary teeth is perfectly unable to be the cause of contraction of the jaw. For, unless the bony bar which lies below our imaginary line be distorted, it matters very little indeed what happens above it, so long as the permanent teeth meet with no obstruction during their exit from their cysts.

A case which serves to exemplify this has occurred in my father's practice, and this I will now proceed to relate. The temporary teeth had all become carious shortly after their eruption, and alveolar abscess had occurred around many of them. The constant suffering attendant upon this state of things had so damaged the child's health that its very life was considered to be in an extreme degree precarious, though its condition was not at that time attributed to the teeth. However, the loss of sleep was obviously so far aggravating the mischief that my father was consulted, and advised the extraction of some of the worst of the teeth. This was done, and marked improvement followed, but the state of the remaining teeth was such that constant toothache soon recurred, and, the child having been placed under chloroform, *all* the remaining teeth were removed. From that moment the general health mended, and from being a sickly child not likely to survive, the patient has grown up into a healthy, vigorous young lady. I am speaking from memory, and, being without notes, am unable to be certain of the exact age at which the operation was done. I believe it was before the eruption of the first permanent molars, but if it were not it was certainly before the eruption of any other permanent teeth.

The mouth was then left edentulous (or at all events with nothing in front of the first permanent molars), and yet, so far from contraction having taken place, the lady now presents an unusually regular and well-developed arch.

Now, the case is very instructive, for it shows very plainly that contraction of the jaw is by no means a necessary sequence of early removal of deciduous teeth, but that, on the contrary, every single one may be removed, and yet the jaw become of full size and the teeth be arranged with perfect regularity. I am of course unable at this moment to give references to recorded cases, but I will ask you to believe me when I say that a good many cases clearly exemplifying this same entire absence of contraction after the removal of two or three contiguous deciduous teeth have been put upon record.

How it happens that the removal of deciduous teeth or anything else of injury which the surgeon's art may do to the alveoli of the temporary set does not materially affect the disposition of the permanent teeth has, I venture to think, been already explained. It now only remains to briefly investigate the forces which ordinarily bring about the regular arrangement of the permanent teeth.

When a tooth is first erupted, its socket is widely open, so that it is capable of assuming a wide range of positions, and in a dried skull would fall out. As is familiar to every practitioner, very slight obstacles, such as a little fragment of a root of a deciduous tooth, will serve to deflect a growing tooth at the period of its first eruption; but, provided no obstacles exist, two very powerful forces are constantly at work to press it into its regular place. Along the outside of the dental arch the muscular structures of the lips and cheeks are perpetually exercising pressure perfectly symmetrically, and on the inside the tongue is with equal persistency doing the same thing. Now if we imagine a plastic material placed between the tongue and the lips, it cannot fail to be moulded into the form of a regular dental arch, and this is precisely what happens with the mobile, freshly erupted teeth; and should it chance that an individual tooth becomes deflected by some obstruction, so that it stands outside or inside its neighbors, it will obviously come in for more than its due share of pressure, and, so soon as the obstruction is removed, will be pushed into place. And as the muscular action of the tongue is more powerful than that of the lips, a tooth which stands inside the arch is reduced to its proper position more quickly than one which lies outside. There is, I believe, no such thing as a natural tendency towards the assumption of the regular form in a dental arch; the physical forces at work, namely, the lips and tongue, are amply sufficient to account for all the phenomena observed; and explanations based upon such a tendency fall, like references to "vital force" as an explanation of physiological phenomena, into the category of mere forms of words calculated to cloak our real ignorance.

An excellent example of the apparently slight force which will determine the position of teeth is afforded by the models of a case presented to the Odontological Society by my friend and colleague, Mr. Turner, in which the whole alveolar border of the one side had been greatly bent inwards by the thickening of the soft tissues of the cheeks. No definable tumor was present, and the cheek was so soft that the finger introduced into the mouth sank into it, the sensation conveyed being that of touching jelly; Dr. Morgan, under whose care the case was, considered it as a hypertrophy of the mucous membrane. Yet, notwithstanding the extreme softness of the tissue, it was competent to effect excessive distortion of the alveolar border.

Certain of the cases known as V-shaped contracted jaws likewise illustrate the power of the pressure of the lips and cheek to modify the position of the teeth, for it will generally be found that this malformation is associated with greatly enlarged tonsils, which necessitate breathing being carried on with the mouth open. Now, as every one can easily verify upon himself, the effect of the mouth being held open is to increase the tension of the soft parts about its angles, and the result of the increased pressure is to bring about a bending inwards at the corresponding point, *i.e.* the bicuspid region. At the same time, the median portion of the arch escapes the controlling pressure which would have been exercised by closed lips, and the effect of this is traceable in the excessive prominence of the median pair of incisors, and also in their oblique position, which makes them correspond with the form assumed by the inner surface of the lips when the mouth is open.

The association of this form of contracted jaw with congenital idiocy, as well as some other considerations, lead me to infer, as I have elsewhere stated,* that the contraction of the face of the jaw is due to causes in operation from a very early period; but the agency of the lips and tongue is that which determines the position of the teeth themselves. It would be impossible for me to elaborate the subject at this moment, and enough has perhaps been said to point out the general drift of the question under discussion, though I fear that the lack of time to prepare myself to address you has rendered my meaning more or less indistinct, so that I must appeal to your indulgence for many omissions and many more obscurities.

USE OF THE FILE.

BY E. G. WHEELER, D.D.S., MOBILE, ALA.

(Read before the Alabama Dental Association.)

It is necessary in every profession or science, in which changes are rapidly going on, that there should be a sufficient amount of conservatism to stand by the old landmarks until new ones can be planted so securely as not to admit of a cavil or a doubt. So one who has watched carefully and analyzed the various theories in connection with dental science, with the various modes of practice for the past twenty years, has seen enough to preserve him from the folly of rushing headlong with the eager throng, who desire nothing so much as change, and vainly imagine that every "change is progress." Such persons, who in the onward march of truth outrun prudence and discretion, will often be found retracing their steps, disgraced by defeat and with a loss of prestige and power.

We deem these remarks as pertinent to the times; for, while no profession has made more rapid strides in *true progress* than ours, yet, with the frantic desire of some to be inventors and leaders, and of others not to be laggards in the profession, I fear that many things have been left behind which are truly valuable in themselves, and their substitutes are far inferior to the original in true merit. My present purpose is to direct attention to that humble little instrument called the *file*, and to consider if it would not be well to go back to first principles, and, if possible, to bring it again into notice and into use. If I am not mistaken, this implement is regarded by many of the profession, and almost universally by patients, as a fearful engine of destruction, and they would shun it as they would a torpedo which threatened to burst beneath their feet.

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* "On the Developmental Origin of the V-shaped Maxillæ," *Monthly Review of Dental Surgery*, June and July, 1872.

After what has been written by Dr. Arthur and others upon the subject, it would seem that there was little more to be said. This would be so, perhaps, were it not for the fact that his views now appear *radical*, and need to be indorsed by the active part of the profession, or clearly shown to be false.

I do not propose to enter into a criticism of Dr. Arthur's recent work, nor to attempt to substantiate the importance of the file as a prophylactic remedy, as being a theory peculiar to him, for I am clearly of the opinion that there are a few, though perhaps in more humble spheres, who make the file as subservient to the highest welfare of their patients as he does to his. Still, I cannot pass this brief allusion to his book without stopping to add my meed of praise to so valuable a contribution to our literature, and honor to him who now stands in my estimation foremost among those who have presented theories sound and immutable as truth itself. But it is often the case that sound theories cannot be reduced at once to practice. A person may give intellectual assent to the truth of a proposition without its having the slightest effect upon his actions; and it is only when the truth comes home to him with all the force of a conscientious, religious duty, that its power is felt. It is to this point the operator must come, or the file in his hands is a failure.

Again, the free and full consent of the *patient* is necessary in order for it to be *most* successful. Although it is true that a conscientious operator goes forward with his work without ever shrinking from doing whatever his judgment dictates, still I hold that the *best* work is done when there is perfect accord between patient and operator. And there is in regard to the file such an amount of popular prejudice that, were we to go to the full extent of the remedy as advocated, without first preparing the way, the patient would probably go into a nervous fit and the operator into obscurity.

How, then, shall those who truly believe in the use of the file as a preventive of decay, as well as a remedy for superficial caries, gain the consent of their patients, whom we suppose to be violently opposed to its use? We answer, by educating them properly, by placing Dr. Arthur's work in their hands to read, and then following up the impressions made by some practical illustrations which may be fresh in his mind. This course will do for those who read and who listen to reason. It will do for parents; but what shall be done for the children, those who are the best subjects for its use, yet whose fears control them to such an extent that a simple operation attended with pain drives them away from your office, perhaps forever?

In these cases there is much occasion for a display of wisdom, patience, and kindness. Reason, and often persuasion, amount to nothing, while a little professional strategy will sometimes secure the object. First use an instrument entirely smooth, and then one with a slight cutting edge; and finally, after fear and prejudice is removed, the patient will submit to whatever is required. This we can do, provided the consent of the parent is obtained; and I hold that it should not be done, as a rule, until such consent is secured. The patient then becomes yours, to deal with as honesty and kindness dictate.

The question then arises, what teeth shall be filed, and how much? The answers to these questions contain the gist of the subject. Whilst we cannot lay down general rules to apply to every special case, still I believe the following will do for ordinary practice.

First, file those teeth which are decayed and need plugging, and file them so effectually that they will not ordinarily come together. Again, I believe this to be good practice even in front teeth where permanent spaces are considered unsightly. Every day furnishes me with fresh proofs of the utility of permanent open spaces between all the teeth, and the folly of that course which endangers them to avoid the appearance which a separated tooth presents. But why should such appearances be considered unsightly? Plainly because we are badly educated; for in a properly and timely separated tooth there is no loss of symmetry, and there is what far excels everything else,—the beauty of utility.

Again, I would file all teeth upon which there was a superficial decay on the approximal surface, leaving them, as in case of more extensive decay, with a permanent space between them.

In some cases, also, I would file those teeth in which I had a right to expect caries to occur, because it had already commenced in the corresponding teeth in the same patient. I say in some cases, for I would discriminate between those who had teeth very susceptible of decay and those who had not, and file only those as a preventive which were of the frail kind, hoping the others would escape caries and filing, as I have known them to do in very many instances.

In answer to the question, *how much?* I would say, when preparing a cavity for plugging, I would file until I had a sound and firm margin to the cavity, even if I removed a considerable portion of the tooth, for, without this precaution, both filing and plugging will be a failure. But whether the separations shall be made entirely to the gum, or whether a shoulder shall be left near the gum, will depend much on circumstances, which the operator must determine in each individual case; but, in spacing bicuspids, where they are very likely to close up; the separation should generally be greater on the palatal and lingual sides, so that, should they approximate, the line of contact will be on the buccal surface and parallel to the axis of the tooth. In this condition they can be very easily cleaned from food, and any softening showing a tendency to decay can be at once detected.

But were it asked if I follow these rules with all patients, I answer, *yes*, if I am at liberty to exercise my own discretion unbiased by the ignorance or false notions of my patient; but, when I have to combat ignorance combined with deep-rooted prejudices, I must yield my opinions to some extent, to secure the confidence of my patients, and consequently the opportunity of enlightening and permanently benefiting them.

We can go but little faster in reform than we can carry our patients, for the reason previously given, that perfect accord between the two is essential to the highest success. How frequently has each one of us heard a torrent of abuse poured out upon some poor unfortunate dentist, because some years before he filed their teeth, which have since been lost; and they stand up before us and assert that no one shall file their or their children's teeth!

Shall we leave such persons to remain in ignorance and to suffer the penalty? or shall we stop and reason with them, and endeavor to point out to them the error of their conclusions? Clearly the latter,—and we shall find very many who will appreciate our efforts to instruct and benefit them. But if neither facts nor arguments will move them, then we must separate their teeth by wedging, or do the best we can without sufficient spaces; or, what is certainly a still better plan for *us*, tell them plainly that you cannot work for them; for I hold it a true maxim, that it is better for the operator to dismiss a patient rather than to perform an imperfect operation.

Every dentist knows how simple it is to operate upon a tooth when we have a free, open space around the cavity. We excavate carefully and surely, and file with confidence of success; but spare the file, and the work becomes cramped and unnecessarily uncertain. The best filings are made in wide spaces, where there is plenty of *elbow-room.*

A recent patient is the most instructive commentary on this subject. Out of seven brothers and sisters, he is the only one who has preserved his teeth, and the only one who has had them thoroughly separated with a file. In his mouth every tooth stands alone, and though many of them decayed before the separation was performed, and are plugged, and the enamel in many places entirely removed, yet the lapse of years furnishes no evidence that he will ever lose another tooth from decay. And, what is strange in this case, though the evidence is positive that his present happy condition is owing almost exclusively to the energetic use of the file, yet it required the most determined resolution on the part of the patient to induce the dentist to perform the work; and even while being done, the operator protested against it as injurious, if not absolutely destructive.

This example illustrates two points,—first, the great benefit of the file; and second, the prejudice which some of the profession have to its use. And this case is not by any means an isolated one, except, perhaps, in the fact that the patient was the first one to discover the nature of the true remedy to be used.

Another example is fresh in my mind: a lady of middle age, who had taken the greatest care of her teeth, and from early childhood to the present time has sought the dentist's office as often as she suspected his services were needed, and yet, under the practice of separating teeth with wedges, has lost many valuable ones, and even the superior incisors were seriously threatened by repeated loss of fillings. But after a free use of the file, she became fully convinced that the former practice had failed in her case, and that an early resort to the file would have saved her from so serious a loss. And in very many cases the conclusion is perfectly irresistible, even to the uninitiated, that the teeth completely separated are far safer than those allowed to remain in contact. We have only to revert to the well known causes of decay to prove the superiority of this practice. I presume we all admit that an acid formed from the decomposition of food lodged between the teeth is the prime cause of their decay, acting, as it does, as a corrosive agent upon the salts which compose their structure; and it is easy to see how that teeth in contact should facilitate this process,—first, because the food cannot be easily removed; and second, because it furnishes a nucleus about which the irritating agents can concentrate. If this is so, then how plain the remedy. Remove the points in contact, and you free the organ from this great danger; and I believe so heartily in this reasoning, and in the conclusion to which it leads, as to plead guilty of malpractice whenever I am persuaded, by fear or favor, to take any other course,—and I cannot think that any candid mind can seriously differ with me. We then ask *again*, plainly, why is it not universally reduced to practice? First, because we do not do our duty; we allow, perhaps, the antiquated objection that filing breaks the enamel, and therefore causes decay, to influence us,—an objection which is refuted by the experience of every dentist who has any knowledge or discernment whatever; for who does not know that a polished surface, even when the enamel is entirely gone, resists caries most perfectly? and how often have we seen teeth broken by violence remain sound, so long as kept smooth by the dentist or by the attrition of food? And I apprehend, were the shape given to the teeth by the South Sea Islanders to become fashionable here, there would be less occasion for *beautiful substitutes* than there is now.

The next reason lies with the patient, viz., fear of pain. I admit the force of the objection, for it is an inquisitorial operation to very many, and the terrible sound haunts them for days afterwards. In such cases use the chisel, as being less painful, perhaps; but space them, even if they have to inhale nitrous oxide to endure it.

But there is another reason, which lies with the operator,—but one I am almost ashamed to mention. It is that filing is *less profitable.* It may never be given as a reason, but I fear it is none the less true. Most dentists have no regular charges for removing superficial decay, and even if they had, it would be no ways equal to the price of two fillings, which almost inevitably occur if the filing is not done early and judiciously. It is a matter of calculation. If they receive two dollars for removing incipient decay when they might get ten dollars for plugging the teeth a little later, they lose eight dollars by being over-wise. If there was no question of honesty involved in the matter, we should do well to take the larger sum. But when a patient places himself in our hands, and we preserve his teeth at an expense of ten dollars, when two dollars' worth of work will do just as well, do we not become swindlers to the amount of eight dollars? This is rather a serious question, and one that every honest person will certainly ponder.

Our time does not admit of our going over this subject except in this brief and unsatisfactory manner. But if the attention of this body is called to the subject, and thought is aroused and discussion is excited, I have no fear but that some good will be accomplished, for where there is much counsel we may safely look for much wisdom.

TIN IN TEETH.

BY E. W. FOSTER, MILWAUKEE, WIS.

Tin, in the operation of filling the teeth, is too often treated as a "poor relation." Among the best operators even, a more general but judicious use of this material would, in numerous cases, produce the most advantageous results; while among those whose operations in gold are not generally successful, an almost exclusive use of this foil would bring about a corresponding quantum of success to themselves and their patients, as against repeated failures with gold, in their hands, as heretofore. It is equivalent to an axiom, that not every dentist is a good operator; and this is more especially true when gold is considered, and therefore true that thousands in the dental ranks to-day will never become efficient with it in saving the teeth. Such facts are very pertinent and suggestive, and rendered daily more so, as the progressive dental wave rolls on and leaves so many among the *débris* of professional incompetence. The same degree of endeavor which in the one case lacked success with gold, if applied to tin would produce good results, and in the average of cases save the teeth.

Tin possesses many considerations of fitness for stopping carious teeth not held by gold. Its freedom from being suddenly affected by thermal changes, its plasticity and ease of adaptability to all the irregularities of the cavity, its permanency or stickiness in the cavity, its comparatively low specific gravity, and other favorable features, are some of the prominent facts connected with this really fine metal, that make it no mean competitor with gold in the daily and important question of filling and preserving the teeth. The prejudice of most operators is generally, we well know, against this foil, and from grounds we think not entirely reasonable, as we may perhaps show. The yellow perspective of a golden shower of ducats to be realized for a certain amount of work if wrought in gold, will find more enthusiastic admirers, we are well aware, than the more humble, dull-gray shower, that would naturally descend if tin only were offered at the altar; even though many of the teeth were no better for the gold, as gold, nor so well off in the ultimate, as with tin. Let us not deceive ourselves in any case, with regard to the harvest that will accumulate from the sowing of that which is not true, and fit, and just, in the varied cases of dental lesion we are called upon to treat and to remove. "For," says a fine thinker, "let law be obeyed, and law is man's minister; let law be disobeyed, and law becomes man's executioner."

The following cases, from among others in memoranda, having been in service long enough for our purpose of mention, we will transfer them to notice here:

Case I., 1866.—"Mr. M. presented his daughter to have her teeth examined and filled. Her growth at present is very rapid. She is of the extreme blonde type, with the lymphatic temperament predominating. Her teeth are milky white and frail, but finely moulded. Most of them have been refilled with gold several times, and by dentists of good repute, but all to no purpose. The father and daughter are discouraged at the efforts of dentistry in its own line, as they may well be. We made a close examination of every tooth and of every fact calculated to bear upon the subject, and finally determined to fill with tin. Though much against the prejudicial opinions of father and child, yet we persisted, and feel confident of a successful issue."

This was seven years ago. Twenty-seven cavities were filled carefully, and polished highly. The plugs are all bright and serviceable to-day, the teeth denser and their color better. None have been refilled, save the substitution of gold lately in a few of the more exposed places in the front teeth; and all is well.

Case II., 1868.—"Miss W. Upper and lower incisors and bicuspids in an alarming state of dissolution. The young lady is evidently about eighteen years of age. Health poor, complexion fair, and temperament nervo-sanguine. The walls of the tooth-cavities are crumbling as if under the action of some strong acid. Filled carefully with tin."

This was five years ago. and at points of exposure the tin is still bright. The teeth have become strong, and the fillings, which are repolished occasionally, have not been replaced, and the entire case is in every way satisfactory both to the young lady and her immediate friends. We have many marked cases of older date, among the frailest class of bicuspids and first molars, but the above cases are sufficient to corroborate the general statement with regard to the saving qualities of tin in the teeth. We have occasion to use it much in our practice, sometimes for permanent fillings, and sometimes to precede gold in the soft vascular teeth of children and youth. As to the extreme permanency of tin when removed from the attrition of mastication, it will be difficult to determine. Yet we have seen tin fillings between thirty and forty years of age, still serviceable and in good condition. We offer further testimony from several well-known operators :

Said Dr. Clark, as reported in convention: "Many people who cannot afford to have their teeth filled with gold will not have them filled with tin. I think we should persuade all to do so who cannot afford to have them filled with gold. I have known tin fillings to last forty years. It preserves the walls of the cavities better than gold."

Dr. Latimer. "I use tin, and like it much."

Dr. Varney. "I indorse all that has been said in favor of tin. *Tin is too much neglected by our first-class operators.*"

Dr. Francis. "I object to tin because it wears away when exposed to friction. *It oxidizes in third molars, and in some other places it is better than gold.*"

Dr. Bronson. "I do not estimate my work according to the value of the material used."

Dr. Castle. "Forty years ago tin was used with great success. It has many advantages."

The very silence of such facts, familiar to so many, speaks louder than the highest pitch of prejudice.

Tin has three oxides,—the sesquioxide, protoxide, and deutoxide, or stannic acid. The latter is a native oxide, or tin stone. The "oxide of tin," so called, and sold to dentists and known in shops as polishing powder, is rather a hydrated equation of stannic acid, or metastannic acid. When the water is driven from it by high heat, a pale, buff-colored substance is the result, which is the polishing powder or putty before mentioned, another use of which we shall speak of further on.

The probable cause of the preservative nature of tin in teeth is due most clearly to the aggregate qualities of the metal before spoken of, such as softness and adaptability, by which conditions under pressure in the tooth-cavity the metal will be found stopping the ends of the larger dentinal tubes and interglobular spaces, which especially abound in teeth of excessive vascular organization; and for such reasons tin is one of the best, if not the best, of single metal to use in such extreme cases.

The low specific gravity of tin, and its non-irritating nature, resembling in the latter trait, though in a less degree, the same remarkable quality possessed by lead, enable it to rest with comparative non-disturbance even in the midst of vital presences. For this reason lead had long ago been used for filling teeth in many countries of Europe. In France especially it was the material *par excellence* for such purposes; and it may not be uninteresting to remark, that the very word in the French language used to signify the term "filling teeth," is "plomber," a word of historical significance in this connection, being derived from the name and the fact of lead being used as a stopping for teeth, even so far back as the formation of that language. Though tin is easier of manipulation than gold, the same care, to the same end, should govern its introduction into the cavity, its condensation and finish afterwards. If the cavity is large, and nerve nearly exposed, the use of a portion of the "polishing powder" before spoken of, moistened with water or glycerin, and applied to the walls of the cavity before the introduction of the tin, will produce agreeable and substantial results. Since so much depends upon the few first weeks in guarding the nerve from excitement and inflammatory action, in all large cavities this simple application of the powder of tin will act as an intermediate substance between two bodies, in this case the tooth and the metal, transmitting none but attenuated changes from one to the other. From the simplest means the grandest results are often obtained. This powder may be used dry or moist; in either case it will effectually stop the porous walls of the cavity, and act as above stated.

It is not less true that a good tin plug is better than a poor gold one, than that tin plugs are equal, or superior even, to the best gold plugs in many places, and under certain chemical conditions of the teeth and oral cavity.

And, if more teeth were filled well with tin, and a fewer number by futile attempts with gold, the million would be more directly and substantially benefited, and indirectly much prejudice removed even from gold as a filling, which now too truly exists in the minds of many from the vivid remembrance of repeated trials. In all the hurry of new inventions to proclaim themselves to the public eye, we must not lose sight of the equally important results derived from the application of old and well-established facts. Tin, one of the oldest discovered, and one of the most universally used of metals in the various wants of the human race, has for many years been used for filling teeth, bringing a success, even from the crudest manipulations, not to be denied; and, when skill and judgment are added instead, corresponding success and benefit will follow.

Before dismissing the subject for the present, it may be well to observe in this place, with regard to many things pertaining to dentistry which may be deemed by some as old-fashioned—and tin-foil as a filling is especially referred to now, in that, old-fashioned or otherwise, we can ill afford not to know of its competitive merits, and utilize them in the various tasks of modern dentistry, to the fulfillment of whose demands every aid should be understood, possessed, and applied—the advance guard of dentistry is not called upon to extract, but to preserve; not to substitute so much as to retain. In the wide range of practice, no one metal in all hands has been equal to the emergency, because every single metal has a limited sphere of action in its own nature, and therefore should not be expected to contend single-handed against the complicated conditions of dental caries. With the great outlying field of capabilities and materials before us as applied to the specialty of dentistry, the best intelligence of the hour need not greatly err. Truth sought after without misgiving, and the humblest as well as the highest evidence taken in every case, and acted upon with skill and discrimination, will most assuredly crown with a high average of success; while by the law that follows the fair performance of any duty, an agreeable memory will be cherished, both by those who are immediately benefited by such labor, and by those who shall follow in our footsteps.

OUR DUTY TO THE CHILDREN.

BY J. W. KEYES, M.D., D.D.S., MONTGOMERY, ALA.

(Read before the Alabama Dental Association.)

OUR profession is pre-eminently a conservative one, and we should deal with the dental organs not only as we find them developed and decayed and diseased, but looking ahead, penetrating the mysterious workings of nature as far as we are able, so as to direct the actions and form the habits of our patients and the public, and so do what in our power lies for the development of a perfect denture.

Through our medical brethren, who are always ready and anxious to assist us, but who, in consequence of the multitudinous matters which press upon them, have but little time to devote to dental medicine, we should instruct those who are aspiring to the responsible duties of maternity that they have it, to a great degree, in their *power*, and impress upon them the sacredness of their duty, to bestow upon their offspring substantial, well-developed teeth.

When woman is performing the high and holy duty to mankind of propagating, nature puts forth all her powers for the full physical development; lays up stores of strength and food for the future; and here our medical brothers, by instructing the expectant mother what food best supplies the necessities of the case, save her and her offspring much trouble and suffering. Let them impress upon the patients that during the period of anticipation and lactation their diet should be abundant and easy of digestion, nutritious, and abounding in those earthy salts so indispensable to the development of perfect teeth.

It is a well-established fact, by observation, that the city-bred bring us the greatest number of diseased organs.

By *city-bred*, I mean not those merely who are brought up in the cities, but all that *class* who lead the artificial lives incident to wealth, or advanced civilization; for as these obtain, as a general rule, nature, instinct, common sense in living, in eating, drinking, dressing, are repressed, put aside, perverted. Let them guard against the luxuries of perverted taste, and follow their instincts in eating the coarser and better articles which furnish what they require. Abandon the white for the black bread. This is very important. Use oatmeal cakes in place of white flour "flapjacks;" eat cabbage, carrots, beans, etc., everything according to nature, and as near to the bark as they can.

Let them learn that whilst that good old maxim, "the nigher the bone the sweeter the meat," is true, and if they *gnawed* the bones more they would have fewer occasions to gnaw the file, they must remember that in the vegetable world the converse, as a general rule, holds good, and the nigher the bark the sweeter the juice.

In fruits, next the outer covering are the richest juices; and in cereals, next the husk is the part abounding most in those supplies needed to build up the framework of the system.

Not unfrequently, three months or thereabouts before the teeth make their appearance, I have noticed many of the symptoms which attend the "*irruption.*" This is the first pressure of the growing organ upon the soft parts: a deep incision, not crucial, but deep and long enough to cut the *stretched* parts, will afford relief. When the teeth press hard on the *gum*, rounding it over the crown full and tight, make a cross to the crown.

This is the period when more miserable teeth are made, more children lost, than at any other. Restlessness, fever, diarrhœa are present; our medical brother is called; and if the child is still drawing its nutriment from the mother, how much too often, in place of dieting *her* and prescribing some palliative for the patient, he prescribes for the patient and neglects altogether that sure source of supply, the mother's milk. In all these cases, the cause of trouble can generally be traced to some article of diet *used* or *wanting*, or to the *emotions*, if of an evanescent character.

But suppose the mother's health has failed, or from some other cause it becomes necessary to supply the pabulum artificially. How many of you have seen the poor little innocents stuffed, yet starved. When nature, by the wasted form, the diarrhœa, colic, etc., is crying aloud for food rich in salts of lime,—sucking with all her energy every source of supply, clinging like a hungry babe to the lean and exhausted mamma, pulling for another drop, and restless, fretful, fearfully excited because food fails, you find farinaceous food, jellies, and that class of nothings as nutriment, all that is allowed.

But suppose the practitioner has looked a little further into this matter, reads the signs aright, and knows the wants of the system. His mistake, I conceive, is to prescribe these salts required, taken and compounded directly from the mineral kingdom. This is, I believe, not in accordance with nature. Animal existence is a long reach above the mineral, and before the animal economy can utilize and properly appropriate the mineral substance, it must first pass through the laboratory of the vegetable kingdom ; and even much in the vegetable diet passes to waste, unless prepared for man's use by being converted into flesh by herbivora. " Thus, hay and grass," says Prof. Voit, of the University of Munich, "though abounding in nutritive elements, cannot be digested by the human being,—their elements cannot be utilized until first converted into flesh by the herbivora."

Hence, to get the prescription into form, so that it can be properly appropriated, you must use, as diet, that vegetable or animal easy of digestion and abounding in it. If the little stomach is too weak to elaborate from the vegetable kingdom directly, bring it nearer, make it into milk.

I have found the goat to be one of the very best sources for the food required. Put Nannie in a pen, feed her with unbolted flour, cooked peas and beans, good sweet grass, hay, etc. : now when the little one wants milk, give it fresh and warm, three or *thirteen* times a day, as required.

When this fearful period is passed, and all the teeth are in their places, then begins the duty of the dentist. You must instruct the mother, for when she has passed the ordeal of maternity she will surely need your services, and you can in your conversation, with natural transition, pass from her duties to her own denture to those of her child. Impress upon her that the preservation of the first set of teeth is necessary to the perfection of the permanent. Tell her to provide a toothbrush at the age of two years, and teach the child by precept and example to brush and pick. This not so much for the good it does *now*, but to beget a habit which will cling through life, and as an example to the other children that may come. Let them use *soap,—toilet,* in the absence of the specific preparations ; it is always at hand,—and warn them to have the first speck of decay cut off or cut out. Impress upon them that the first permanent teeth appear at six, behind all the temporary ones, and that these *must* be preserved.

Here I would say a word about filling those teeth. As a general rule, I do not think it best to fill them with gold, because you cannot do it well. Your little patient becomes weary, restless; you cannot keep the cavity dry. But the parent and patient think it all right, it is gold and must be good; and hence neglect, from the feeling of security. But fill the grinding surface with tin or os, the approximal with os, and tell them they are to be carefully watched, and at a future day, when it becomes necessary, you intend to fill with gold. By this plan you put them on the look-out, and they will watch or bring them to you to inspect, and thus your inferior metal becomes transmuted.

The first molars *must* be retained until the bicuspids are in place,—articulating; then, if they cannot be made permanent members of the denture, extract, and let the reserve, the twelve-year-old molar, hasten up to fill the place. Point out how beautifully nature arranges her work: a year before the first temporary teeth are dropped she develops the first permanent molars, to stand and keep correct the occlusion of the jaws, the face in shape, and masticate the food, while the entire temporary set are being replaced by permanent ones.

Then should this first great grinder fail, as it too often does, the second or twelve-year molar steps forward to fill the gap, and then at maturity another reserve is ready to do its duty as a masticator.

When all the teeth are developed, the worst period of life is passed, provided proper care and precautions have been used. The habits are fixed, the brush is used twice daily, and the pick invariably after eating. If I were called upon to prescribe one thing tending more to preserve the teeth than any *one* other, I should unhesitatingly recommend the toothpick, made of some soft wood, to be used freely always after eating anything, and to be used when you do not eat. The necessity for frequent visits to the dentist should be forcibly impressed upon the minds of our patients, not because *they* think something is the matter, but for fear there may be. When the patient discovers a decay, it has usually gone to a mischievous extent. If the decay is found in its incipiency, time and money are saved, and a better operation than filling can be had. By frequent visits, the teeth are kept in good condition,—an occasional repair is all that is needed, and he who regularly pays his dentist only cheats his doctor.

I have said nothing about stains, calculus, etc. Of course you will not fail to insist upon their removal, and a patient, persistent perseverance in preventing their return.

Especially remember the *moss*, that little lichen which fastens itself on the teeth just below the margin of the gum, particularly upon the upper incisors and cuspidati, and, like the lichen on the granite, works a sure disintegration. By these desultory remarks, gentlemen, thrown together at odd times atomically, I may say, I have not presumed that

I would instruct, but have intended them merely as reminders of what you already know, with the hope that such of you as are lukewarm may be incited to an earnest endeavor to enlarge the usefulness of the dental profession.

THE CANINES IN EXPRESSION.

BY A. H. THOMPSON, D.D.S., TOPEKA, KANSAS.

UPON the anterior surface of the skull rests and lives the region we call the face, the seat of emotional expression and index to the soul. Its mobile parts are in immediate sympathy with our every feeling, ever ready to respond to the promptings of that *aide-de-camp* of the emotions, the great *portio dura*. This pliability of these tissues constitutes the possibility of animated facial expression as specially developed in the *genus homo*. Countless generations of our progenitors, subjected to peculiarly favorable conditions, have worked wonders in the development of this special faculty.

The galaxy of muscles devoted to this poetic privileged duty are numerous, and disposed to admirable purpose. These muscles of expression arising from the margin of the face or from bases toward the margin, and converging towards a center, form, as it were, a *wheel of expression* and radiate from center to circumference—from insertion to origin. The center of this circle, the hub of the wheel, is the *mouth*,—the center of expression that portrays so vividly every change of feeling. And if the mouth is the center, the *corners* of the mouth are essentially the centers *of* the center, the nuclei of the nucleolus, into which, on either side, the muscles of expression are inserted. At the corners of the mouth the first sympathy with the feelings is manifested,—sensitive as a galvanometer, susceptible to the slightest nerve-current from variability of feeling,—constituting it the seat of *primary* special expression. The cheeks and lips, the lateral and anterior soft parts, intimate in position, are the regions of *secondary* expression, receiving animation from the centers of primary expression.

The fact of the soft tissues of the face being inconsiderable in thickness renders it evident that the hard parts, lying superficially beneath, are intimately concerned in the faculty of expression. The oral opening and its attachments are moulded to the teeth and their processes, which support and give them form. The contrast, in event of loss of the teeth, is proof of this fact. The molars and incisors contribute in a mass to the support and general contour of the expressional features, and influence them secondarily. The three sides of the dental arch, the anterior of the incisors in front, and the buccal of the molars and bicuspids of the two sides, constitute three areas supporting the regions of secondary expression, and contributing to its manifestations. The canines occupy intermediate positions at the two angles of the junction of the lateral surfaces with the front, forming the turning points and divisions between them, and are the prominent places in expression. The corners of the mouth, occupying similar positions in the softer tissue, occur immediately over the cuspids; the three surfaces of secondary expression and the two angles of primary expression of the two tissues, lie parallel and in contact, the canines marking the angles in one, the corners in the other. Moulded in growth together, both tissues receive the impress of character controlling development. The canines thus support the corners of the mouth, and more than any other individual teeth are the *teeth of expression.* They form a base or pivot on which the soft parts turn and glide in the intricacies of emotional expression. They lend that force and character so necessary to beauty in perfect development. They stand in the very front, and, though not active nor pliable, are essential to natural expression; and when lost by neglect or disease, no finite power can restore the lost effect.

Although the cuspids only affect directly the parts within a radius of half an inch, yet within that limited area is the center of emotional expression, from which the whole face receives animation as from primary centers.

The ridge from apex to apex, both of the inferior and superior cuspids, is important, as supporting and influencing the lateral and vertical play of the muscles. The inferior canines are less prominent in position and distinct in effect than the superior, owing to the internal occlusion of the lower teeth, yet they materially affect the lower face and contribute to the special and general influence of the superior cuspids.

The criminal disregard of the importance of the canines in restoration of expression, in the insertion of artificial dentures, is so general as to be painful in the contemplation. These teeth are commonly deprived of their dues, and their wonderful aid in expression lost to the features. The proper study of their influence in restoring natural expression would result in commendable improvement of the present inefficiency of artificial dentures for this purpose. Artificial teeth are usually arranged with mechanical accuracy in a horse-shoe circle, never even suggestive of an appreciation of the importance of the planes and angles so prominent in nature. Instead of recognizing only the secondary influence of the lateral teeth, they are pushed into prominence, and the cuspids suppressed, at the expense of all hope of restoration of expression to the face. Give these expressional teeth their dues in dental prosthesis, and thus avoid the too just cognomen of *false* teeth, as applied to the products of this ruling. The scale of expressional power of these teeth between the extremes of excessive exaggeration and complete suppression, places a variety of invaluable keys to natural expression at our disposal. Each step in the series between the extremes is full of character peculiar to itself, subject to modifications in posture of the crown, axial position and inclination, angle of bearing, degree of curvature, prominence of root, etc., in countless variety. We can only hope to hasten the time when a just regard for æsthetical rules will totally annihilate the present degenerate "piano-key" style of dental architecture.

PROCEEDINGS OF DENTAL SOCIETIES.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE fifth annual meeting of the Pennsylvania State Dental Society will be held at Lancaster, Pa., on Tuesday, July 8, 1873, commencing at 10 o'clock A.M., and continuing three days.

The members of the Society are earnestly requested to be present, and members of the dental profession throughout the State and adjacent States are also cordially invited to attend the meeting, and participate in the discussions.

The following essays will be read, and the subjects discussed:

"Discolored Teeth and Treatment," by R. Huey, D.D.S., Philadelphia; "Dental Nutrition," by Prof. G. T. Barker, D.D.S., Philadelphia; "Mechanical Dentistry," by J. D. White, Alleghany City, Pa.; "Improvements in Operative Dentistry," by F. Hickman, D.D.S., Reading, Pa.; "Treatment of Dental Irregularities," by S. H. Guilford, D.D.S., West Philadelphia, Pa.; "Dental Medicine," by George Elliot, D.D.S., Meadville, Pa.

Public Address, on Wednesday evening, by Prof. E. T. Darby, D.D.S., Philadelphia.

Lancaster is on the line of the Pennsylvania Central Railroad. There are trains running east and west every two hours. Orders for excursion tickets can be obtained from the undersigned, which will be received at all the principal stations between Pittsburg and Philadelphia, on the Pennsylvania Central Railroad; and between Erie and Sunbury, on the Philadelphia and Erie Railroad.

SAMUEL WELCHENS, *Corresponding Secretary.*
135 N. Queen St., Lancaster, Pa.

NEW JERSEY STATE DENTAL SOCIETY.

THE third annual meeting of the New Jersey State Dental Society will commence at Long Branch, on Thursday, July 10, 1873, at 10 o'clock A.M.

Every member of the profession in the State is invited. Drs. Louis Jack, of Philadelphia, and Frank Abbott, of New York City, have been invited by the Society to join in clinics. Session to continue three days.

LEO H. DE LANGE, *Recording Secretary.*

EDITORIAL.

SYSTEMIC MANIFESTATIONS OF LOCAL LESIONS.

The circle of physiological and pathological sympathies, existing between the mouth and every portion of the animal economy, has been considered in the light of various constitutional conditions manifesting themselves in the oral cavity; but the disturbance of harmony in other organs originating in dental lesions show, not less than in the illustrations already given, the significance of these relations.

Systemic and local derangements thus originating are sufficiently numerous and grave to command the thoughtful attention of every practitioner of medicine. General systemic derangements, as the result of diseased dental organs, might be considered as improbable but for the instances, with which every dental practitioner must be familiar, in which anæmic symptoms, anorexia, debility, constipation, nervous derangement, mental depression, palpitation, tinnitus aurium, etc., after successfully resisting constitutional medication, have yielded promptly to such treament as was found necessary to restore a healthy condition of the mouth. Indeed, so frequently have fretful, nervous, irritable, despondent conditions been found dependent upon dental lesions, that it would appear to be a plain duty of the practitioner, failing to recognize other causes for such manifestations, to examine carefully the oral cavity.

When it is considered that, by means of its lining mucous membrane, the mouth is related by continuity with the pharynx, œsophagus, stomach, and intestinal canal, and with the larynx, trachea, and bronchi, and by the nerves with which it is so abundantly supplied direct or sympathetic relations are established throughout the entire economy, it will be seen that various pathological conditions from dental lesions are natural and inevitable. The relations by contiguity with the eyes, ears, and nares also indicate significant pathological sympathies, as in diseases of the antra of Highmore, which are almost invariably dependent upon diseases of the teeth; also, various local pains, facial palsy, some forms of amaurosis, conjunctivitis, strabismus, pain in the eyes, otorrhœa, otalgia, deafness, etc. Considering the regional anatomy of the teeth, it is not difficult to account for the complications involved by the spread of inflammation from the peridental membranes of diseased teeth, or from exostosis of their roots, nor the nervous disturbances which may arise from exposure of their pulps and from other pathological conditions.

So numerous and so varied are the disturbances,—radiated, reflex, and dependent upon constitutional irritation from lesions in the mouth,—that their enumeration in detail would be tedious. The inharmonies thus induced may range from a mere sense of discomfort up to and including the gravest and most formidable lesions, involving even life itself. The influence of the first dentition, in producing varied and grave derangements of the nervous system, intestinal tract, respiratory organs, etc., is well understood. The direct pressure upon the fibrous integument by the advancing tooth, and the indirect compression of the developing and sensitive pulp thereby occasioned, cause irritation and congestion of the mucous membrane, and a general irritability of the nervous system, which finds expression in convulsions, paralysis, and other serious lesions, many of which, as strabismus and epilepsy, remain throughout life. To this cause also is unquestionably attributable a large proportion of the mortality of infancy.

Though there is generally but little inconvenience attending the second dentition, yet occasionally, when the jaws are crowded, and especially during the eruption of the wisdom teeth, there is considerable pain and swelling, and sometimes sore throat, difficulty of deglutition, and severe constitutional disturbance. Aphonia, hysteria, neuralgia, epilepsy, trismus, facial paralysis, amaurosis, and various anomalous nervous conditions, have been found to depend upon the irritation produced by the eruption of the *dentes sapientiæ* into a crowded arch.

Of the reflex, secondary, or remote disorders having a possible—some of them a frequent—origin in the mouth, may be enumerated abnormal sensations occurring in almost all parts of the organism: tingling, formication, numbness, vertigo, disordered vision, muscæ volitantes, amaurosis, headache, hemicrania, spasmodic stricture of œsophagus, irregular respiration, dyspnœa, spasmodic cough, muscular spasms, trismus, paralysis, facial and general; neuralgias of the face, scalp, eyes, ears, neck, head, arm, leg, mammæ, uterus, and sciatic nerve; gastralgia, cardialgia, nervous dyspepsia, drowsiness, mental confusion, hysteria, insanity, chorea, epilepsy, tetanus, convulsions, coma, and death.

It is remarkable, too, how frequently—nay, how generally—dental lesions—which are subsequently proven to have been the exciting cause either of constitutional disturbance or of pain, or of interference with function in other organs—fail to attract attention, by reason of the absence of any decided tokens of irritation in themselves. Indeed, so constantly is this exemplified that the announcement to a patient that the expression of pain outside of the mouth, or of systemic inharmony, is in any way related to the teeth as causative, is generally received with decided distrust of the opinion, if not of the practitioner who ventures the diagnosis. Many instances of the truth of this position have been recorded, illustrating how variously local lesions express themselves, and how little reason there often is for the patient or medical adviser to suspect the origin of the trouble. There is frequently in such cases not only no soreness, no pain, no discoloration, no cavity of decay, no exposure of pulp or sensitive dentine, no recession of the gums exposing cementum, no overcrowding of the arch, no external sign of trouble; but from exostosis, or from deposits in the pulp-cavity of osteo-dentine, there may be disturbance from pressure, which may be reflected to distant organs or which may cause general derangement of health.

It is admitted that there is nothing new or original in these statements; their truth has been demonstrated in the experience of every practitioner of dentistry. Many practitioners of medicine are, however, strangely oblivious of such facts, and too frequently ignore their force, to the great disadvantage of their patients. As a rule, more consideration should be given by physicians to dental lesions as possible causes of obscure systemic manifestations.

STRUCTURE OF THE WHITE BLOOD-CORPUSCLE.

We had hoped to be able to lay before our readers a recent paper by Dr. Joseph G. Richardson, of this city, upon the structure of the white blood-corpuscle, but have been compelled reluctantly to abandon the idea of its republication for want of space.

The London *Lancet* of February 8th has, however, presented a *résumé* of the paper, which will be found in our Periscope for the present month, and which will, we think, interest our readers, especially those who have become skilled observers with the microscope. The experiments detailed had for their object the elucidation of mooted points respecting the salivary fluid, and the author's observations have thus an important bearing on a question in which practitioners of dentistry are specially interested. As the experiments can be readily repeated by any microscopist accustomed to working with a one-twenty-fourth, or even a one-sixteenth immersion lens, we trust that the statements will be thoroughly tested by other observers.

Dr. Richardson, claiming to have established a new doctrine in regard to the salivary globules, asserts that "the corpuscles of the saliva are migrating white blood-globules, which, wandering out into the oral cavity, have become distended by the endosmosis of the rarer fluid in which they float," and considers this view demonstrated by the following experiments:

In the first place, a drop of fresh human blood from the finger is deposited upon a slide and covered with a thin glass, to the upper edge of which a very gentle current of pure water (from a suitable reservoir, as, for example, that of a "growing slide") is conveyed by a delicate filament of linen thread,—the excess of fluid being at the same time conducted away by means of a slip of bibulous paper, slightly moistened, and applied to the lower margin of the covering glass. In this way the liquor sanguinis can be gradually diluted, and the leucocytes of the blood *pari passu* dilated until they assume the exact form and general appearance of the salivary globules, as they float in the normal liquid of the oral cavity.

Nearly thirty years ago this transformation of the blood leucocytes under the action of water was noticed and partially described by that acute observer, Dr. William Addison, as a curious modification of the white corpuscles; but his knowledge of the phenomenon required to be supplemented by the demonstration furnished in Cohnheim's beautiful experiments, as given to the world in 1867, of the mode in which leucocytes escape from the blood-vessels by amœboïd movement, before it was sufficient to form a basis for this theory, respecting the nature and origin of the salivary bodies.

The keystone of Dr. Richardson's researches, however, consists in his latest observations upon the corpuscles of the saliva. In these experiments, he informs us, salivary globules, grouped around a mass of leptothrix growth, comprised in a fragment of tartar from between the teeth, *were seen*, when exposed to the gradual action of a salt solution having the specific gravity of about 1028 (sodic chloride, 53 grains; water, one pint), to contract to the size of ordinary leucocytes, and, in some instances, to resume (as he styles it) the amœboid movements which are so characteristic of the white corpuscles of the blood. In this way he seems to adapt to the elucidation of this problem the schoolboy's method of proving a sum in simple addition, by subtracting from the total one of its constituent quantities, and obtaining the other as a result.

SUSPENSION OF THE DENTAL TIMES.

The April number of *The Dental Times* completed its tenth volume, and with that issue its publishers announce its indefinite suspension. The *Times* has always held a good position in the ranks of dental journalism, and we shall be sorry to miss its pleasant face.

Until its republication is decided upon, we cordially invite its patrons to transfer their subscriptions to the Dental Cosmos, but especially we solicit the contributions of those who have written for its pages.

CORRECTION.

In the list of graduates of the New York College of Dentistry, published in the May number of the Dental Cosmos, the name of Bernard Hess, of New York, was accidentally omitted.

ANOTHER DENTAL COLLEGE.

We have received the announcement of a new dental college, under the title of the Maryland Dental College of Baltimore City.

The first annual session will commence October 1st, 1873.

The Faculty is constituted as follows:

Professors of the Theory and Practice of Dental Surgery, Pathology, and Therapeutics.—Samuel H. Williams, D.D.S., Byron F. Coy, D.D.S.

Professor of Dental Mechanism and Metallurgy.—M. Whilldin Foster, D.D.S.

Professor of Clinical Dentistry.—Edward P. Keech, D.D.S.

Professor of Anatomy.—Henry H. Keech, D.D.S.

Professor of Physiology and Dental Hygiene.—Richard P. Winder, D.D.S.

Professor of Chemistry and Dental Materia Medica.—Samuel M. Field, D.D.S.

Professor of Comparative and Microscopic Anatomy and Demonstrator of Anatomy.—L. McLane Tiffany, B.A., M.D.

Demonstrator of Mechanical Dentistry.—Albert P. Gore, D.D.S.

Dean of the Faculty.—Richard B. Winder, No. 128 West Madison Street, Baltimore, Md.

PERISCOPE.

The Structure of the White Blood-Corpuscle.—Dr. Joseph G. Richardson, Lecturer on Pathological Anatomy in the University of Pennsylvania, and Microscopist to the Pennsylvania Hospital, in the reprint of a paper from the Transactions of The American Medical Association, discusses the nature of the white blood-globules, and their relation to those of pus and mucus. Dr. Richardson, as the result of some previous researches, advanced the opinion that the salivary corpuscles were in reality migrating white blood-corpuscles that have become distended by endosmosis of the salivary fluid. After giving a concise *résumé* of the information acquired within the last few years, by the labors of German histologists especially, the author proceeds to say that Stricker and Rollet do not accept the existence of a distinct cell-wall in the white blood-globule as proven; that they consider the laws according to which leucocytes take up fluids as unknown, though probably attributable to diffusion in part; and that the molecular or "dancing" movement in the salivary corpuscles differs from that seen in colorless blood, pus, and other corpuscles, in that those movements cease in the former, but continue in the latter, on the addition of a half to one per cent. solution of common salt. The object of Dr. Richardson's experiments—six in number—is the further elucidation of these three points; and the following additions, he considers, have been made to the information already derived from German and English histologists. The white blood-corpuscle is a cell composed of, in the first place, a nucleus (or nuclei) which possesses the power of independent amœboid movement, and is insoluble in water, but capable of slowly imbibing that fluid until swollen to nearly double its normal size. The cell-wall of the corpuscle is a membranous envelope, insoluble in water, even when boiling, too thin to exhibit a double contour with a magnifying power of 1200 diameters, but firm enough to restrict the movement of its contained granules within its limits. Its exterior is adhesive, so that surfaces or particles coming in contact are liable to become attached. Some of the phenomena observed would lead to the supposition that this membrane is dotted with minute pores, which permit delicate threads of the soft protoplasm it incloses to be extruded. The laws by which leucocytes take up and part with fluid seem to be simply those of the dialysis of liquids through animal membranes by endosmosis and exosmosis, as investigated by Graham in 1855. The structure of the particles existing in the protoplasm, and exhibiting dancing motions when the latter undergoes dilution, is yet undetermined, although the movement is probably merely a molecular one; and some of the particles, at least, are minutely granulated fatty matter. In regard to any difference of their motion in the salivary bodies, Dr. Richardson's experiments, as detailed by him, are opposed to the assertions of Stricker and Pflüger; for, contrary to the views of these histologists, no essential difference exists in the effects of salt solutions of various strengths upon the salivary, pus, and white blood-corpuscles. From this circumstance, in conjunction with the fact discovered during one of his experiments, that the salivary globules, when acted upon by the denser saline liquid, contract to the size of the blood-leucocytes, and manifest amœboid movements, the author concludes that the corpuscles of the saliva are "migrating" white blood-globules, which, "wandering out" into the oral cavity, have become distended by the endosmosis of the rarer fluid in which they float. Lastly, our author thinks it possible that further investigation of the revolving motion sometimes (not always) produced by a solution of ferrocyanide of potassium in the white blood-corpuscles may throw light upon the curious rotatory movement in the cells of certain plants, which has for a long time been deemed inexplicable, and by a late writer is attributed to the presence of cilia upon the inner surface of the cell-wall?—*Lancet.*

WHAT IS THE USE?—The first question usually asked by the average member of society on hearing of an important discovery is: "What is the use?" If this is not answered in a satisfactory manner, the subject is at once dismissed as unworthy of consideration. We were lead to reflect upon this propensity, to underrate scientific discovery unless an immediate use could be found for it, the other evening when listening to Professor Tyndall's exposition of the laws of light. Newton's analysis of light by passing a beam through a prism was a discovery of no apparent value at the time it was made. The spectrum was very beautiful to look upon, but few persons could understand or appreciate it. No one could have anticipated that this was the germ of a method which would gradually lead to the discovery of new metals on our earth, to a study of the atmosphere of the sun and planets, that minute quantities of substances would be detected by it in mineral waters and rocks, that steel would be manufactured by watching the light produced by burning gases, that an instrument called the spectroscope would become one of our most important adjuncts in the study of astronomy, in technical researches, in the detection of new bodies; and thus the ray of light passed through a hole in the shutter becomes, in the contemplation of future men of science, the starting-point in a great array of discoveries. * * * * * *

These are some of the discoveries that passed through our minds while listening to the lectures of Professor Tyndall. The practical application of the subject is that no discovery is made in vain. As there is a conservation of forces, so is there also a conservation of discoveries. No force is lost any more than matter, and no discovery is lost in making up the chain that may lead to important results. Men who are engaged in what appear to be purely scientific pursuits, without the least practical bearing, are the ones who ought to receive more sympathy than they generally obtain. Their pursuits appear to be so useless to the common mind that they fail to receive due appreciation. It is safe to take for granted that every scientific discovery at the present time has its value. We may not appreciate it at the moment, but, as in the case of Newton's prismatic colors and Faraday's benzole, the time is sure to come when the world will profit by the discovery.—*Scientific American.*

The Degeneracy of the Teeth.—In the paper upon the "Degeneracy of the Teeth," contributed by Mr. Alfred Coleman to the "*St. Bartholomew's Hospital Reports*," that gentleman states that the many causes which combine to produce the present degeneracy may be summed up in the words, "condition of modern civilization," but selects for prominent notice two causes: first, Mr. Darwin's notion that our ideas of beauty lead to the propagation of defective arches, and consequently crowded teeth; second, that we eat exceptionally soft food, thereby depriving both the teeth and gums of the amount of stimulus necessary to their well-being.

No one who has really investigated this subject can entertain a moment's doubt that a marked and rapid deterioration has taken place within the last fifty years, and notwithstanding the amount of attention now directed to the subject the evil increases rather than diminishes; but the reasons advanced by Mr. Coleman cannot be accepted as conclusive, and the time has arrived when information that can throw any light upon the matter ought to be sought in all parts of the world, and every effort made to discover the real predisposing causes of this grave affliction of our race.

The writer of the present paper having traveled extensively, and examined the teeth of different races of men living under varied conditions, has arrived at the conclusion that the increase of dental decay in the nineteenth century is not so much owing to the "condition of modern civilization" as the condition of modern medical practice; that, in fact, where European physicians do not practice, dentists have no work to do, except to replace teeth lost from old age.

In support of this view any amount of evidence might be offered, but two instances only will be given: first, the Chinese settlers in the Straits, and second, the native princes of the Island of Java. * *

Mercurials and the mineral acids may have something to do with this state of things, but the question naturally suggests itself,—Is not vaccination the root of the mischief? A bovine disease is introduced into the blood of an infant, and its constitution becomes thoroughly under its influence during the earliest stages of dental formation, causing that defective formation from which the present generation so generally suffer.—*Albert Carter, Esq., in British Journal of Dental Science.*

Hints on Therapeutics.—At the present time there is a great desire to advance dentistry to the same standing as the other branches of the medical profession, but this I consider can never be accomplished so long as all researches are directed towards the improvement of instruments and mechanical appliances, and not also towards the investigation of the action of drugs upon the diseases and complications that occur in dental practice, for which dentists have generally to call in the aid of medical men, of whose profession theirs is, in point of fact, a branch. It is for this purpose, therefore, that I call attention to a few drugs which are rarely if ever mentioned in works on dental therapeutics.

Chloride of ammonium is of great value in a number of diseases that occur frequently in practice, but, as a rule, is much neglected by medical men in this country, though in Germany it is most extensively employed. In the latter country it is highly valued in the treatment of inflammatory, rheumatic, and neuralgic affections, and, in fact, in all cases where we have been in the habit of prescribing mercurial preparations. The "why and the wherefore" of its action I cannot determine, nor has any author afforded me a satisfactory explanation; but I can state from experience that the results to be obtained from its administration in chronic rheumatism and in certain forms of neuralgia are markedly beneficial.

Sir Thomas Watson, in his standard work, "The Practice of Medicine," mentions the good results he obtains from this drug in that variety of neuralgia which affects the teeth and alveolar processes, the pain being of a dull aching character, and so constant and severe that death itself would be considered a blessing, the patient rapidly becoming exhausted from the persistent pain and want of sleep. In these cases there is no apparent disease of the teeth, gums or alveolar processes, though I do not doubt that exostosis of the teeth in the neighborhood of the pain would be discovered if the teeth were extracted, for the symptoms are exactly those described by Mr. Tomes in his "System of Dental Surgery," pp. 440–4. If this be so, then the chloride may be the means of saving many teeth which are usually taken out on the chance of their being exostosed, as in cases mentioned by Messrs. Fox and Tomes as having occurred in their practice, where relief was only obtained after every tooth had been extracted.

It was in consequence of observing the authoritative manner in which Sir Thomas Watson spoke of the rapid cure, that I determined to treat all similar cases according to his recommendation. The prescription I invariably give is—

℞.—Ammon. Chlorid., gr. xx;
Sp. Chloroform, ♏ xv;
Tinct. Lavand. Co., ♏ x;
Aquæ, ad ℥j.
M. ter die sum.

The chloric ether is added to render the mixture more palatable, and also on account of its action as a diffusible stimulant, for persons suffering from this complaint are often in need of such a fillip. From two to four doses of the above mixture are generally sufficient to effect a cure when all other treatment has totally failed. It is advisable that the remedy be not continued beyond six doses, not because there is any danger in its administration, but because I have found that if recovery has not then taken place the drug is of no further benefit.

When the pain is very acute, five minims of the liquor morphiæ hydrochloratis B. P., added to each dose, is of great service in its relief. The cessation of pain here is not due to the morphia, for such a minute dose given alone would not have the slightest effect, but it appears to quicken the action of the chloride.

In a few cases where there was the same intense, dull pain, but evidently due to a decayed tooth, of which the pulp was exposed, or to stumps, I was able to relieve the pain temporarily by means of this remedy. Here, of course, there is no possibility of obtaining a permanent recovery, but there seems a likelihood that by the application of the usual local remedies to a *recently* exposed pulp, with full doses of the chloride internally, inflammation of the pulp might be subdued with more certainty than if local means were alone used, thus allowing the tooth to be stopped afterwards in the ordinary manner. The same benefit might also accrue in those cases where there is irritation or inflammation of the pulp without any lesion being observable in the substance of the tooth, provided the treatment was adopted so soon as the symptoms were sufficiently clear to enable us to diagnose the cause of the suffering.

Upon observing the rapid recovery in the above class of cases I determined to employ the chloride in the treatment of other varieties of neuralgia. The only varieties, however, that seemed to be much benefited were those in which there could be traced a history of rheumatism or gout, either hereditary or acquired. Of these forms of neuralgia, sciatica and lumbago are the most frequent; but as they do not come under the observation of dentists, I have only stated the fact in order that, when a case of neuralgia of the face presents itself to their notice, for which no immediate cause can be discovered, but where a history of rheumatism can be gathered, they might, with propriety, order the chloride, especially if all other remedies have failed; but as I have no experience of such cases, I cannot speak as to the probability of relief.—*W. J. Barkas, L.R.C.P., in Monthly Review of Dental Surgery.*

ON OXYCHLORIDE OF ZINC AND THE CEMENTS ALLIED TO IT.—The fact of the existence of a basic chloride of zinc which can be used as a cement appears to have been known for a considerable number of years, without any further study having been made of its peculiarities, and, so far as I am aware, without the discovery of many others which are equally good although different in composition.

It must be noted that the hardening of an oxychloride of zinc does not depend on the combination of a mixture of oxide of zinc and chloride, but on the formation of a hydrate. This may readily be proved by heating a block of cement until the water is driven off and until acid fumes begin to make their appearance. If this block is ground up in a mortar it will again set hard with water only, exactly in the same manner as plaster of Paris. A cement similar in properties and solubility may be made with the nitrate and oxide of zinc, and another, which is decidedly more insoluble but does not set so hard, with the sulphate. To make the latter, as the sulphate of zinc will not make a sufficiently strong solution, it is necessary to heat the crystallized sulphate in a muffle until all the water is given off, and to grind up the result with four or five times its weight of oxide. This powder sets with water only and is a good base for gold fillings, from its perfect freedom from all caustic or irritant action, and also from the fact that it attains its maximum hardness rapidly.

The cements formed with oxide of zinc and salts of the weaker acids, although curious and interesting from a chemical point of view, are practically useless from the ease with which they are decomposed. A similar class of compounds, which, no doubt, will become of considerable commercial value, may be made with basic salts of both lead and antimony. These are, however, useless for dental purposes from their color, which is in every compound I have tested so intense that no mechanical admixture will cover or alter it to any practical extent.

The mixture of inert substances with these cements is, with one single exception, a decided evil, as, although apparently harder, they are neither less soluble nor do they resist grinding wear any better, and in many cases not so well. The one exception is clay, which has the power of resisting the penetration of fluids into the body of the composition and diminishes the solubility to a considerable extent.

A mixture of ground flint, glass, or similar material, makes an apparently harder material, but when tested for solubility in acids, with occasional friction to keep the surface clean, it will be found not only much more soluble, but also the surface, instead of being smooth, dissolves very unequally. If a precipitated powder is taken, such as sulphate of barytes, the surface keeps smoother than with a powder ground by machinery, but the solubility is still increased by its addition, although not to the same extent.

With regard to varnishing, as the compound is a hydrate, taking up chemically only a certain quantity of water, a protection of some kind is necessary, as, until the combination is almost complete, water would soak in and render the surface porous, and for the same reason surface burnishing is also an advantage, making the surface decidedly harder.

The addition of borax to the solution, which has frequently been recommended, makes the cement, when set, rather harder, but it is open to two very strong objections. It slowly decomposes the solution, forming a borate of zinc, which crystallizes out, rendering the solution useless or nearly so, and it also delays the setting so much that there is considerable difficulty in keeping it dry. The decomposition of the solution may be overcome by the addition of from 1½ to 2 per cent. of boracic acid to the powdered oxide, but in this case the solution must have a strength of at least 160° Twaddell instead of about 99° to 100°, and it must be mixed into a very stiff putty; the time of setting is then about seven or eight times as long as without boracic acid. When such an extremely small proportion makes so great an alteration, it may well be imagined that the cause of failure in these cements is entirely owing to want of proper care in the preparation of the oxide. Out of a large number of samples obtained from every possible source, and at prices varying from 4½*d.* to 5*s.* per pound, not one was found sufficiently free from impurity or prepared with sufficient care to make even a tolerably good cement, and in several samples, professedly pure for medicinal use, very rough tests showed a large percentage of basic sulphate, carbonate, and also more or less arsenic, cadmium, metallic zinc, and other matters; in fact, I may safely say that no oxide of zinc which is prepared on a commercial scale can possibly be made sufficiently good and uniform to make a cement which can be at all depended on. The solubility of two samples professing to be the same will vary 20 or 30 per cent.

The color of the oxide of zinc is the only certain test of its quality for cement, and varies from a light yellow to brown according to the mode of preparation. The brown anhydrous crystalline form is almost insoluble in strong acids, and will remain undissolved for months in the weaker acids where the ordinary commercial oxide would dissolve in a few minutes. The crystals are hard enough to scratch steel, and a cement made with this form is both intensely hard and almost insoluble. It is, however, both difficult to prepare, and almost unmanageable in the mouth from its extreme slowness in setting.—*Thomas Fletcher, Esq., in British Journal of Dental Science.*

On the Primary Dentition of Children.— * * * Authorities differ somewhat as to the order in which the first teeth appear, as well as to the time of their irruption. I have found the data given by Dr. Eichmann, founded upon the observation of four hundred children, to correspond pretty exactly with my own experience; and it is sanctioned by the high authority of Dr. Schoepf Merei, of Pesth, by M. Trousseau, by Vogel, and others. Dr. Eichmann states that the twenty deciduous teeth make their appearance in *five groups*, at five distinct periods, and in the great majority of cases in the following order: The first group consists of the two lower median incisors, which generally appear between the twenty-eighth and thirty-third week. In only three instances out of the four hundred children did the first lower incision appear as early as the twentieth week, the next tooth, however, not appearing before the thirty-first week. Judging from my own observation, I should put six and a half months as the average date of the appearance of the first tooth. The second tooth frequently follows the first within a week, but it is not unusual for two or three weeks to elapse before the first group is completed.

The second group consists of the four upper incisors, of which the two central ones are the first to appear, the completion of the whole group requiring from three to six weeks. When a child has six teeth, therefore, there are four in the upper jaw and two in the lower. Trousseau observes that this fact, known to every woman who has had the care of young children, is strangely ignored by medical men, even by some who have written upon the very subject of dentition; and I am inclined to believe the observation is true of some practitioners of America, as well as France.

The third group includes the two lateral lower incisors and the four anterior molars. Generally, the upper molars are the first to come, next the lower incisors, and lastly the lower molars.

The fourth group consists of the four canine teeth, of which the two upper are called the eye teeth and the two lower the stomach teeth.

The fifth group comprises the four posterior molars.

Although there are exceptions to the above order, yet they are rare in healthy children. There is more variation in the age at which each group begins to appear, as well as in the length of time required for its complete evolution; but within certain limits the period is tolerably exact. The average age at which the first tooth pierces the gum may be stated at six and a half months, and the group is usually completed at seven months. The second group usually begins to appear at the age of nine months, and requires six weeks for its completion. The third group appears at the age of twelve and a half months, and is completed at fourteen months. The fourth group usually begins at eighteen months, and often requires eight weeks, and sometimes longer, for its completion. The fifth group does not commonly appear before the age of twenty-six months, and also takes at least eight weeks before it is finished.

An important fact in the history of the primary dentition, and which must never be lost sight of by the practitioner, is, that after the irruption of each group, there is a pause of longer or shorter duration, which is quite constant for each interval. Thus between the first and second group there is a pause of two or three months. Between the second and third group the interval is of about two months' duration. Between the third and fourth group the interval is from four to five months. Between the fourth and fifth group there is a pause of five months. I will arrange all these data in a tabular form, so that you may more easily comprehend them, and retain them in the memory.

1st group begins at 6½ months—completed at 7 months.
Pause of 2 or 3 months.
2d group begins at 9 months—completed at 10½ months.
Pause of 2 months.
3d group begins at 12½ months—completed at 14 months.
Pause of 4 to 5 months.
4th group begins at 18 months—completed at 21 months.
Pause of 5 months.
5th group begins at 26 months—completed at 30 months.

During the intervals between the successive groups the process of dentition is arrested, and the symptoms to which it often gives rise subside. The child is tranquil, sleeps well, is free from nervous and inflammatory troubles. Now is the time when any change which is to be made in the diet, mode of life, etc., should be begun. The important question of weaning should always be considered in reference to this period. If the mother be robust, and have plenty of milk, the child may be allowed to nurse, at least in part, with advantage until the fourth group is completed, when there will be an interval of five months, in which he will be free from danger of convulsions or diarrhœa, and will have ample time to get accustomed to his new diet. Unfortunately, in a large number of cases, especially in cities, the supply of milk and the mother's strength require the child to be weaned earlier, and then, if possible, this should be done immediately after the completion of the third group, when the interval, though shorter than that which follows the canines, will yet be sufficient to permit the infant to get used to an artificial diet before the fourth begins to appear. Of course you will not be governed by the state of the teeth alone in this important question; other considerations, especially the season of the year, the mother's health, and the supply of breast-milk, will have due weight; but I wish to urge upon you that in the case of delicate children, with a tendency to nervous or inflammatory symptoms, weaning can be much more safely accomplished during the intervals between the successive groups of teeth than at any other time. With perfectly healthy and robust children such precautions are not always necessary; but in delicate, town-bred infants—in those which show any disposition towards convulsions, diarrhœa, hydrocephalus, or that indefinite array of symptoms which are often styled "scrofulous"—they cannot be neglected without risk. * * —*Boston Med. and Surg. Jour.*

ON THE CHOICE OF ANÆSTHETICS.—Our one reason for abandoning chloroform is its danger. If we could get rid of this, it would certainly stand without rival. My own experience of chloroform has been very considerable, and for a great variety of cases. I have had but a single death in my own practice, but I have been the witness of several in the practice of others. I have also had among my own patients several very alarming occurrences, in which it was with the greatest difficulty that death was prevented. In the case of a girl at Reigate, in whom apparent death occurred during excision of the knee, we had to perform artificial respiration for at least ten minutes before any signs of reanimation occurred: In another case at the London Hospital, in an amputation of the thigh, the period during which I thought the patient dead was almost as long. In both these instances, death-like pallor of face and absence of pulse (cardiac syncope) were the alarming symptoms; and in both artificial respiration, irritation of the surface, and the use of brandy enemeta, were the means resorted to. In addition to them, I have had many cases in which the pulse failed temporarily, and in which we had to begin artificial respiration in order to ward off the more dangerous condition. During the last four or five years, I think I have had fewer alarming cases of this kind than formerly; and I attribute this in part to the skill and care of those who have given chloroform to me, and in part to the fact that I have been very particular as to the administration of stimulants (brandy) before using the anæsthetic. I have never of late used chloroform without knowing that my patient had fasted for some hours, and had taken a dose of brandy within the last half-hour. These seem to me the two principal points; but, if you insist upon the one (the fasting), it is additionally important that you attend to the other. In a fasting and exhausted state of the system, we have the condition in which cardiac syncope is the most likely to occur.—*Clinical Lecture by Jonathan Hutchinson, F.R.C.S., in British Med. Journal.*

FARADISATION IN SUSPENDED ANIMATION FROM CHLOROFORM.—Deaths from chloroform have lately been more frequent than at any former period. If this death-rate continue, the public and the profession may consider this agent, with all its benefits, to be, after all, a fatal boon.

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I have recently published (*British Medical Journal*, May 25th, 1872) some cases which occurred in the Bristol Royal Infirmary, where instant faradisation was remarkably successful in restoring animation when suspended by chloroform, and under circumstances similar to those of recent occurrence. I have to add to them another case since recorded by my friend Mr. Morgan, which also occurred at the Bristol Royal Infirmary, and at which I was present. (*British Medical Journal*, June 1st, 1872.) In this case, the success of the electric current was as marked as it could possibly be. Mr. Morgan writes as follows: "His pulse stopped, and he seemed *in articulo mortis*. Instant recourse was had to the electro-magnetic battery, and almost as instantly the pulse returned, and the man was safe." This case, added to those which I have reported, makes seven, in each of which the heart suddenly stopped after the administration of chloroform, the patient appearing dead; and, with only one exception (Case II.), its motions were as instantly restored by faradisation, and life saved in each of them.

It may be asserted with confidence that there is not, in all that is recorded concerning chloroform, so strong a body of evidence in favor of any other means to save life after its use, as there is in favor of instant faradisation. I might have felt less confident as to the value of this evidence, were it not that I have had assurances from competent judges in the profession, both in these countries and in America, that the cases I have recorded amount to a demonstration that the electric current, so applied, is the most powerful agent known to restore animation when suspended by chloroform. If this is true, it may be asked, is it right, in cases where the heart suddenly stops, to waste precious moments with such frivolities as drawing out the tongue, etc.? The facts related are in themselves sufficient to carry conviction; but that conviction becomes more certain when we consider what electricity can do,—that it is "the most powerful agent with which we are acquainted for exciting muscular motion even after death." The heart being a muscular organ, what better means do we possess of restoring its motion, when entirely suspended, than the most powerful excitant to muscular motion that we know? When the natural vital motions of the heart suddenly cease, what better than the best artificial vital excitor we know to restore them as suddenly? Can anything else in nature do it as surely and as quickly? The question must cross the mind, Is it right persistently to ignore evidence of this kind? Those who do so may incur a heavy responsibility. It is little better than rejecting the most important evidence in a trial where life is at stake. When inquests have been held in any of the recent cases, the public are simply told that "the usual means were tried and failed"; they ought to be informed what those means were. Without this information, there is little or nothing to be learnt from such statements.

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To give full effect to this potent agent, it is necessary to be prepared for immediate action; the battery should be in the operation-room, ready for use at a moment's notice; and the moment the heart ceases to beat, the battery should be instantly employed, and as instantly the heart begins to beat again. This is the experience derived from six cases at the Bristol Infirmary; and the facts cannot be disputed. No disbelief, no want of confidence in the remedy, no prejudice nor obstinacy can alter these facts. To attempt to save life, when the pulse is suddenly and entirely gone, by such frivolous proceedings as drawing out the tongue, etc., is only to lose precious time. The tide of life is ebbing too fast to be arrested in its course by such means.

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To those who will still give chloroform, a word of caution as to the preparatory means which should be employed previous to its use may not be entirely useless. All those who have seen semi-solid food gurgling in the pharynx, during the adminstration of chloroform, must have felt in dread of its passing into the trachea, and so causing death; hence all agree that food should not be taken for some hours previously; but, with such a depressing agent, is it well to encounter vital power depressed by the absence of all nutriment? I have thought not, and for some years have always given about half a pint of strong beef-tea and three or four ounces of brandy about two hours before the operation. If given in this way, nutriment and stimulant have passed into the system before the time of operating; little, if any, remains in the stomach to be rejected. In private houses, beef-tea may not be always ready, but eggs and brandy are; these answer the purpose equally well. I have occasionally found that this preparation makes chloroform unnecessary; the patient, when on the table, has left it to me to give it or not, as I wished; I need not say that, having seen two deaths from its use, and wishing not to see a third, I decided not to give it; the operations were borne without much pain.

In a future paper I may attempt to show that from four to six ounces of brandy, given before an operation, are an efficient anæsthetic. I have taken off the limb of a drunken man, injured beyond all chance of recovery, and he hardly knew what was being done.—*Thomas Green, F.R.C.S., in Brit. Med. Journal.*

THE RECENT ALLEGED DEATH FROM NITROUS OXIDE GAS.—Scarcely has the final report of the committee appointed to investigate the merits of nitrous oxide as an anæsthetic, containing the record of 58,000 administrations of the agent, been presented, when there comes to us from a distant part of the country the sad and startling intelligence of a death occurring apparently in consequence of its effects.

In offering a few remarks upon this distressing event, permit me to call attention to the probable number of administrations in which this forms, in this country at least, the first attended with fatal results. When the report referred to above was being drawn up, it fell to my province to collect for the committee the returns therein given. To satisfactorily attain that object, I made application to the makers of the gas to furnish me with the names of those who most largely consumed it: with much courtesy they at once complied with my request. It was almost entirely from these that I was enabled to collect the above numbers; but of those to whom I applied, about 250 in number, only about half responded to my request—they were, however, by far the largest consumers; still, with the lists furnished to me it was not difficult roughly to approximate the probable number of administrations effected by the whole. Making some allowance for exaggerations in the numbers returned in a few cases, I came to the conclusion that, up to the end of April last, there had been between 70,000 and 80,000 administrations of the gas. To a considerable number of persons making their own gas, no application was made; and if to their administrations be added those which have been effected since their returns were handed in, we may, I think, fairly and safely set down the number, up to the present time—it is probably greater—as 100,000.

Sad as the circumstance is, it is one hardly unanticipated by any who have had much experience in the use of the agent; for, although they have regarded it as the safest anæsthetic in use, they have never looked upon it as perfectly safe.

To patients who have put such a question as this, "Is the gas perfectly safe?" I have invariably answered, "No; but I do not think that in taking it you run a greater risk than you do in undertaking a railway journey."

In a paper published in the *St. Bartholomew's Hospital Reports for* 1869, I make the following observations: "If untoward results should occur, and it is hardly to be expected that some may not, should the nitrous oxide be exhibited many hundreds of thousands of times, we apprehend it will be some form of mischief occurring at the brain, from the giving way of diseased vessels. The occasional turgescence of the vessels of the face and head, in those especially whom we regard as likely subjects for apoplexy, has inclined us to this opinion; and whilst we have in all cases of this description most closely watched the effects of the agent, we have in some refrained from administering it at all."

From the somewhat imperfect report that has reached us respecting this case, I am much inclined to the belief that the cause of death was apoplexy. The symptoms recorded do not at all correspond to those which were witnessed in the case of numerous animals destroyed by the gas during the experiments performed by the committee referred to. Death was in all cases the direct result of the gas being continued until respiration had fairly ceased; recovery invariably took place without any assistance whilst respiration continued, and artificial respiration always succeeded after it had ceased, provided the heart was still in action. Still more convinced should I have been that the cause of death was that to which I refer it, had we been informed that artificial respiration had been resorted to. It could not, under such circumstances, have saved the patient, but it would have helped to decide this point, as well as being a satisfaction to know that the plan strongly urged by the committee in both their reports had had a fair trial.

In relation to this distressing case, the question arises, Are we justified in continuing the use of this agent for dental operations after what has occurred? My own impression is, that we are; the comfort, ease, and in very many cases, improved condition of health—this latter often means the prolonging, *i.e.* the saving of life—which have been obtained through its instrumentality, fully warrant, though with every care and precaution, the continuance of its use, even if its effects prove fatal in one case in every hundred thousand.—*Alfred Coleman, in British Med. Jour.*

Death from Nitrous Oxide Gas.— * * * The use of the gas in qualified hands is, I venture to say, not only the safest anæsthetic, but almost absolutely safe. This is proved by the unvarying results of experiments upon the lower animals. It is found that when the gas kills, death always commences at the lungs, and that so long as the heart's action continues, the creature recovers (as a rule, spontaneously) on admission of atmospheric air, or aided by artificial respiration. The gas has not, like chloroform, an accumulative poisonous action, and it never kills suddenly by direct action upon the nervous centers. The statistics of chloroform show one death in every 3,000 cases; the statistics of nitrous oxide show one death in several hundred thousand cases.

Chloroform has been rarely employed except by well qualified medical men; nitrous oxide has been given extensively and indiscriminately by large numbers of unskilled practitioners. I must not be understood to imply that, because statistics and our knowledge of the physiology of the gas show it to be a safe agent, it is therefore one which can be used without damage by the ignorant. The condition of insensibility from an anæsthetic it is probable will never be free from some small danger, either from direct action or intercurrent causes; and in the case of operations in the mouth there is always the risk of foreign bodies being drawn into the larynx. In the event of an accident, the administrator ought to be able to recognize the symptoms, and to act instantly. It is not enough to render the patient insensible, and to trust in every case to an unaided recovery. The Exeter fatality shows that under some circumstances a death may follow the inhalation of the gas in the hands of qualified practitioners. Can those who have a mere knowledge of the physical signs of anæsthesia,—who cannot, for instance, distinguish between syncope and apnœa,—continue to employ nitrous oxide, and if they do is it uncharitable to hope that on the occurrence of an accident, after the unmistakable warning which they have now received, they may not escape the legal penalties which such temerity will certainly call for?—*Henry Sewill, M.R.C.S., in Med. Press and Circular.*

A Frequent Cause of Neuralgia.—Dr. H. W. Grant, in the Virginia *Clinical Record*, September, 1872, says: Nineteen years of close observation and investigation have enabled me to conclude in my own mind as to the proximate cause of many neuralgic affections, demonstrating to my mind that a large number are sympathetic and symptomatic of dental derangements; but which nosologists have named in accordance with the region of the body in which the pain is experienced.

I have named these sympathetic neuralgic affections, dento-neuralgia, predicated upon the proximate cause, the peculiar condition of super or sub-excitement—irritation, if you please, of the dental nerves—the fifth pair of nerves—within and upon the bony tissues of the teeth and their maxillary bones and investing periosteum in their anastomizing connection with other sympathetic nerves; a morbid condition of the bony structure of the teeth, whether from original constitutional deficiency, or produced by vitiating gastric acids, or the premature decay of the teeth, dependent upon the absence of proper nutrition, or from scrofulous, scorbutic, or syphilitic diathesis, the action of mercury, arsenic, antimony, iron, quinine, iodides, etc., all of which exert their several peculiar influences upon the dental organs, and hence upon their nerves, causing dento-neuralgic symptoms in various parts of the body.

It is not my intention to detail the affections of the dental system in this paper; but I will mention one or two exciting causes. We find the dental tissues irritated and changed in character from the causes I have already enumerated. And any one of you gentlemen may observe, in many of the teeth which you occasionally may extract, the animal portion absorbed from the early constituents of the upper portions or orifices of the fangs, leaving them in a semi-transparent condition; the lower portions and necks to the crowns of the teeth running opaque, and presenting a normal appearance. While this change is being produced in the fangs, the alveoli and the dental periosteum become exquisitely sensitive—moderately to cold or warm applications, but intensely acute to the presence of acids, sweetmeats and confectioneries. These are the primary effects of dental derangements and the premonitory symptoms of dento-neuralgic affections.

These teeth are often glassy, brittle, breaking readily under the extracting instruments. In many of the transparent fangs of such affected teeth, you will find the extreme points absent, from absorption; impressing the uninitiated with an unfounded idea or belief that he has broken off the apex of the fang in the act of extracting the tooth; the sharp speculated points prove the contrary.

In the class of teeth whose crowns are worn down and their pulp chambers filled in by a deposit of osseous matter, amber-like dentine, we too often find the maxillary absorbents exercising their baneful influence upon the roots of the altered teeth, with recession of the gums and their alveoli. Medical practitioners, and alas! some dental practitioners too, designate these affections "scurvy in the gums."

The absence too of antagonizing teeth is another exciting cause of dento-neuralgic affections. The lower jaw, or more properly speaking "the inferior maxillary," finding no resistance, nothing upon which to rest, is by the contraction of the temporal muscles closed to an unnatural extent toward the superior maxillary, which, acting like an overshut door lacking the resistance of the proper door-post, overstrains its hinges; so the inferior maxillary bone overstrains its joints, affecting the nerve to an extent to superinduce nervous irritability and hence sympathetic neuralgic paroxysms.

The dental system thus affected, presenting no external physical disintegration (or decay), exhibits some of the causes of dento-neuralgic affections in contradistinction to odontalgic pains portrayed by Prof. Bond. Dento-nervous irritation being established in the dental system, which from "the infant muling and puking in the nurse's arms" to "the last scene of all" when death closes our earthly career, daily presents to our observation neuralgic, symptomatic, and sympathetic paroxysms.

Thus are daily presented to the medical world, the physician, the surgeon, and the dentist, innumerable instances in which each and all may recognize the essential starting point of a correct diagnosis of many rheums, pains, and convulsions, which without any apparent exciting cause, experience shows to affect patients from childhood to old age, dependent upon and arising from a source often entirely overlooked and even little dreamed of in medical and dental philosophy.

It is useless to cite the countless number of cases where patients have been subjected, for years, to the most harassing and I might almost say empirical treatment, in which have been used narcotics, sedatives, emollients, irritants, stimulants, counter-irritants, moxas, nervines, antispasmodics, sudorifics, phosphates, chalybeates, alkalies, acids, arsenic, mercury, copper, bismuth, iodine, potassa, quinine.

Then again have been brought to bear phlebotomy, cupping and leeching, alteratives and aperients, cold and hot baths, sulphur-baths and fumigations, electricity, sea-bathing, the surgeon's knife for the excision of some innocent, unoffending ganglionic center.

Then again have been called into requisition homœopathy, hydropathy, spiritualism, polarization, clairvoyance, Thompsonianism, and nostrums, which have all stepped in and taken their turn; "certain to effect a cure." If the now wretched, patient sufferer has had sufficient stamina, or vital force, to resist these terrible onslaughts and assaults upon the citadel so frail,—so wonderfully and fearfully made,—it has been to sink into helplessness and despair.—*Half-Yearly Compendium of Medical Science.*

The Internal Use of Aconite in Neuralgia.—I send you a few notes of cases showing the great use of tincture of aconite, both alone and in combination with other remedies, in neuralgia and muscular rheumatism. I now speak of its *internal* use, in contradistinction to *external.* I give five cases, each the representative of a different class of the same affection:

Case 1.—Mrs. D. had been for some time under my care for violent paroxysmal neuralgia of the face, partially due to carious teeth and partially to gastric derangement. As she would not have the bad teeth extracted nor attend to her digestion or bowels, I was perpetually trying to invent something new to mitigate the agony she suffered. On August 29 she began to take tinct. aconit. ♏x., tinct. colchici ♏iij., brom. potass. gr. v. each third hour, with spt. chloroform ♏xx. Having been prepared for this treatment by a purgative, on the 30th she had almost, and on the 31st completely, recovered; and this happy state of things lasted for six weeks. Of course in this case extraction of the bad teeth and proper attention to the digestive organs would have afforded most hope of a radical cure.

* * * * *

I have now given five cases, each a representative of a different class of rheumatic and neuralgic affections, in which I have found the internal use of tincture of aconite exceedingly useful. It remains for me to say in what class of cases I have not found such good effects. They are two—first, in acute rheumatism attacking the joints; and, secondly, in lumbago its internal use has proved of much less value. In the latter affection, however, complete relief may often be obtained by the application of chloroform, liniment. aconit., and liniment. belladonnæ in equal parts on lint with oiled silk over it. In conclusion, I would add that constipation, or a disordered state of the stomach, or both, should be remedied before commencing the use of aconite, or *at least* in such cases suitable remedies for the relief of such a state of things should be combined with it. As a rule aconite seems to have more effect when combined with spirit of chloroform than when taken alone—at least, so far as my experience goes. It is well always to commence with a small dose, as I know of no remedy so variable in its effects on different constitutions. I have seen a single dose of eight minims produce decided tingling *all over the body* in an adult, and I have given as much as twenty minims each third or fourth hour without any tingling at all.—*A. Leslie Mease, M.D., in Med. Times and Gazette.*

Fluid Extract of Aconite as a Local Application.—For two years past I have made numerous experiments with aconite topically applied. After requesting others to use it thus, I am enabled, from their experience and my own, to deduce the following results: All cases of swelled face arising from dental and neuralgic pains yield readily to a solution of the fluid extract and water, equal parts.—*Dr. E. J. Marsh in Eclectic Med. Journal.*

Neuralgia—Galvanism.—In order to cure neuralgia by galvanism, we should use the continuous current, by means of small wet sponges attached to small conical conductors. The constant galvanic current has a truly marvelous effect over pain, whereas the interrupted current is of little or no service. The battery used should be Weiss's, sometimes known as Foveaux's. Eight cells of this splendid battery suffice, with very small sponges (about as large as would fill the end of a thimble). They should be applied to the painful part, an inch or two apart, and moved about, without being actually removed from the skin, for about two minutes. After resting a minute, they should then be applied again for two minutes.—*Braithwaite.*

Brown-Sequard's Neuralgic Pill.—R. Extract. belladon., gr. $\frac{1}{6}$; extract. stramon., gr. 1–5; extract. cannab. ind., gr. $\frac{1}{4}$; extract. aconit., gr. $\frac{1}{3}$; extract. opii, gr. $\frac{1}{2}$; extract. hyoscyam., gr. $\frac{2}{3}$; extract. conii, gr. i.; pulv. glyc., q. s. For one pill.—*Southern Med. Record.*

Salivation from Ether.—Are there any instances recorded of *salivation* resulting from inhalation of ether? A week ago to-day I etherized a healthy young man, aged twenty-two, and who had not taken any medicine within a year, for the purpose of removing a splinter of iron from beneath the flexor pollicis of the right hand, where it had been lodged fifteen months, to his great discomfort.

There was nothing peculiar in the proceeding, either on the part of the specimen used, for we had administered from the same vial before, or on the part of the patient, who presented a history of health. More than three ounces were required to produce complete anæsthesia, but this, from an experience of some two hundred cases, we do not consider at all unusual.

Calling upon the patient a few days after the operation, which was successful, to inquire after the wound, he was suffering from profuse salivation.—*T. J. Hutton, M.D., in Med. and Surg. Reporter.*

Odontocele.—The boy, twelve years of age, now before you, has been annoyed for some months with a tumor upon the right side of the roof of his mouth, which, although it gives him but little pain, yet is sensitive to the touch and is gradually increasing in size. I place my finger upon it, and from its firmness immediately suspect its nature. Let us look at his teeth. The arches seem perfect, yet as we count accurately we find that while there are fourteen teeth in the lower jaw, in the upper there are but thirteen. The missing one is the second bicuspid upon the right side. He says that he never had any teeth extracted, and the explanation of the tumor is simple. It is an odontocele or compound cyst. To be certain of the diagnosis, however, I make a little incision into it, and distinctly feel the missing tooth. I enlarge the puncture and extract the tooth. The boy will have no further trouble. —*Clinic of Dr. J. E. Garretson, in Med. and Surg. Reporter.*

Abscess due to Caries of the Hard Palate.—The patient is a middle-aged woman, who has also a swelling in the roof of her mouth. It is soft and fluctuating, and is situated far back near the uvula, and nearly in the median line. I introduce a bistoury, draw off a considerable quantity of pus, and with a probe am able to discover a large portion of the palatal plate of the superior maxilla as in a markedly carious condition. The bone is not yet ready for removal, and we can only wait, keeping the parts thoroughly syringed with permanganate of potash or carbolic acid solution, several times daily. The cause of this disease I judge to be from depraved vitality, as the woman seems to be debauched, and as no traumatic or dental origin is evident. She should, therefore, be nourished and strengthened by every possible means.—*Clinic of Dr. J. E. Garretson, in Med. and Surg. Reporter.*

Ulcerative Stomatitis.—Dr. Fordyce Barker says: In the treatment of this affection, for a few years past, I have mainly relied upon the sulphites either of magnesia or of soda, and I have cured my cases more rapidly than I formerly did, when I depended upon the chlorate of potassa, borate of soda, etc.—*Southern Med. Record.*

Scurvy in a Child Ten Months Old.—Edwin R., aged 10 months, was brought to the dispensary on Tuesday, January 7th, 1873. The mother states that she only suckled the child for three weeks, when her milk entirely left her. She then fed it upon condensed milk and water, allowing it two tins of milk weekly until it was six months old. Up to this time it did well, and got fat. When the infant had passed the sixth month she fed it upon Chapman's entire wheat flour, condensed milk, and water, giving it six teaspoonfuls of the flour, with three of the milk, together with water, in the twenty-four hours. For two months after using this diet nothing was noticed, but since then she says it has been gradually wasting. Three weeks before coming to the dispensary she observed the child cried very much upon its knees and ankles being moved, and that its gums were swollen and bled very easily. Finding it got worse she brought it here, when it was found to present the following appearances:—The trunk and limbs generally wasted, with sallow-colored skin; on both legs were small petechiæ, which did not disappear upon pressure; upon looking into the mouth the gums on the upper jaw were found to be in a spongy condition, bleeding readily upon being touched; teeth, of which six were cut, not loose; tongue clean, and breath not offensive. The child was quiet and sleepy, but cried immediately upon its ankles or knees being moved, which appeared swollen. The mother also says that lately it has had diarrhœa, but she has not seen any blood in the motions. It was ordered—℞. syr. ferri iodid. ♏xv., ol. morrhuæ ʒj. 4tis horis; also to drink plenty of cow's milk, and a little lemon-juice.

January 14th.—Gums have resumed their normal state; petechiæ have entirely disappeared; there is no pain upon moving the ankles or knees, and the child appears quite cheerful.

Remarks.—One peculiar feature in this case is the early age in which the disease appeared. On referring to Copland's "Dictionary of Medicine" I find it is stated that scurvy may occur at any age from childhood upwards; and again, Billroth, in his "Surgical Pathology," says that this disease is very common in children; but I cannot find any case mentioned in which the patient was so young as the above. What was the cause of it in this instance? Dr. Aitkin, in his "Practice of Medicine" (vol. ii., page 74), gives the causes of scurvy as follows:—"1. Deficiency of absolute nourishment. 2. Improper adjudication of the nutrient and respiratory principles of the diet; its monotony. 3. Bad quality of the diet; improper cooking, or none at all. 4. Exposure to cold, combined with imperfect clothing and labor beyond the strength of the best-fed men. 5. The persistent pernicious influence of residence in a paludal district." For the first six months, according to the mother's statement, the child was fed upon condensed milk and water alone, and did well; so I do not think that the cause can be put down to this diet, but rather to what followed, and then not so much to the diet given as to the short supply of it. Three teaspoonfuls of condensed milk together with six of the flour in the twenty-four hours would certainly not be sufficient for a child of that tender age; and yet the mother expressed her belief to me that the disease was due to over-feeding! In a week the child was free from the disease; but I fully believe the result to be attributed to the good supply of cow's milk rather than to the lemon-juice or the iron, although they all may have had their share in the cure.—*W. H. Jalland, M.R.C.S., in Med. Times and Gazette.*

On Cancer of the Sublingual Glands.—"I am about to direct your attention to a frequent and grave affection: epithelioma, or cancer of the sublingual glands. The subjects of this affection generally come to us with ulcerations which have been cauterized and tormented for several months, and in such a manner as to render surgical intervention difficult. Authors scarcely allude to cancer of the sublingual glands. I have seen a dozen cases of this affection. The affection is generally presented in the form of sharply-cut linear ulceration at the floor of the mouth. The base is indurated; the ulceration extends sometimes towards the lingual mucous membrane, sometimes towards the periosteum. Difficulty in deglutition, salivation, pain radiating to the neighboring parts, even to the ear, are the chief symptoms; this extension of pain is probably due to exposure of the inferior maxillary nerve. All kinds of caustic agents have been applied to these ulcerations. The diagnosis is easy. Aphthous or syphilitic ulcerations do not occupy this position, and have not indurated bases. I have had occasion to study this affection anatomically, and have observed that the seat of the disease is the sublingual glands; the acini are increased to thrice their normal size, the epithelium is altered, all the cells present large nuclei, each containing three bright nucleoli. The progress is extremely serious. I have seen recoveries from epithelioma of the tongue and of the inner surface of the cheeks, but when the sublingual gland is the seat of the disease, relapse occurs rapidly after operation, even before the cicatrization of the wound. This is one of the most frequently fatal forms of epithelioma. I have performed several operations; have enucleated the tumor and removed it in different ways by means of the écraseur; but all to no purpose; relapses were speedy and death rapid." —*Half-Yearly Abstract of the Medical Sciences.*

Cement for Handles.—A cement of rosin and brick-dust may be used to fasten on the handles of instruments that have become loosened. The rosin should be heated, and the brick-dust stirred in; then, a small portion of it should be poured into the hole of the handle, and the shank of the blade should be warmed, and pressed in. Another good cement is simply gum-shellac.—*American Artisan.*

Solution for Cleaning Gold and Silver.—Meusnier has taken a patent in France for a gold polish, prepared as follows: Two lemons (almost dry) are cut into small pieces, and put in 800 cubic centimeters seven fluid ounces of white wine, and left three days; ten grains chloride of iron, ten grains tripoli, five grains grated lemon or orange peel, and twenty grains of heated sugar, are then added.—*American Artisan.*

Conservative Dental Surgery in the Army.—In answer to a question put by Dr. Brewer in the House of Commons on the 1st of the present month, Sir H. Storks explained that all army surgeons were required to be competently instructed in dentistry before receiving their commissions. It may not be generally known that the question of conservative dental surgery received the attention of the heads of the Medical Department many years ago, when the necessary "stopping" and "scaling" instruments were issued to the service, together with a circular calling attention to the importance of preserving teeth, where possible, in preference to extracting them. All large hospitals and stations are provided with these instruments, which are kept in order and available for use by any medical officer who may require to use them.—*Medical Times and Gazette.*

Attention has been called to the above subject by a paragraph in your last week's issue, in which the reply of Sir Henry Storks to an inquiry from Dr. Brewer in the House of Commons as to the competency of army surgeons to practice dentistry is quoted. As one taking a large interest in the subject, I beg your permission to inquire for the proofs that "all army surgeons are required to be competently instructed in dentistry before they receive their commissions." What is the extent of the instruction? by whom imparted? and at what schools? Sir Henry states that the instruments necessary for stopping and scaling teeth were issued to the service many years ago, with a circular calling attention to the importance of preserving teeth when possible, instead of extracting them; but the results he has omitted to mention; and I shall be glad to be corrected if I am found guilty of misrepresentation in stating that no remedial measures have ever been practiced in either service, and that extraction alone is resorted to under all circumstances.

Reference to a recommendatory notice published many years ago is hardly conclusive evidence that the inquiry raised was uncalled for, nor is the assurance of an available supply of instruments at every large hospital and station suggestive of much relief to those who know themselves, by experience, to be in the hands of men uninstructed in their use.—William Donald Napier, in *Medical Times and Gazette.*

The question put by Dr. Brewer in the House of Commons to the Secretary of State for War, and which was first brought under the consideration of the members by Mr. Napier, is one of more importance than might be supposed. The education of the medical officers of the army and navy in dental surgery is, of course, attended to in some degree, and they are probably as well acquainted with the subject as other general practitioners. But it should be remembered that they may be called upon to preserve teeth, and, in localities where dental surgeons cannot be obtained, to perform operations of difficulty and delicacy. In distant countries especially, a knowledge of this branch of the profession would undoubtedly be extremely useful to themselves and highly beneficial to those intrusted to their care. We think that the best mode of obtaining the end in view would be to require special attendance on a course of instruction in this subject. There would probably be no objection made to such a proposition by those who are most interested in it—the medical officers of the army themselves.—*Clinical Lecture by Jonathan Hutchinson, F.R.C.S., in British Med. Journal.*

HINTS AND QUERIES.

WILL some one more experienced than I am in the application of the rubber dam to the upper molar or bicuspid teeth please to state how it is best applied in a case of proximal decay of first and second bicuspids, both of which it is necessary to fill? Is it possible to isolate both teeth at once with a *cordon* of rubber, so that access can be had to both cavities for excavating and filling? or is the individual isolation of each tooth absolutely necessary to secure the cavities against an inroad of saliva or of mucus through the gums which adhere to the side of the necks of the teeth, and which by the former method of insulation is not "*without the pale?*"—RUBBER DAM.

WILL some one please describe in *detail* how to fill with tin-foil a proximate cavity in a bicuspid or molar that was broken into the grinding portion of the tooth, or give the most approved method of such an operation, under the head of "Hints and Queries?"

WHAT is the best practice in changing or refitting a temporary rubber plate so that it may be worn with comfort?—KANSAS.

REPLY TO "R. McN."—"I have a patient, a lad about fourteen years of age, whose teeth appear perfectly sound, but when extracted the roots are as soft as cartilage, and their terminations more or less absorbed. What is the cause? and is there any treatment I can adopt which will be of any use?"

A case of this kind finds its analogue in the disease known as rickets,—a condition of constitutional expression having its predisposition in hereditary transmission; characterized by non-solidification of the growing layers of bone, by the formation of medullary cavities in the older or more mature bones, and by excess in the formation of phosphorous and lactic acids, and also of the earthy phosphates.

"As rachitis is congenital, or as it associates itself with the dentinal periods, so are manifested the effects of the condition upon the health of the teeth; these organs being delayed in their development, disposed to caries, and not unfrequently of such loose relation to their sockets from aplastic softening of the peridental tissue as to be displaced by slight force; the periodonteum, and also the pulp, may be affirmed to present evidence of the common amyloid degeneration, as seen in the viscera, particularly in the liver and spleen. The delay in the cutting of the teeth is simply delay in development, the albuminoid pulp lacking organic force to secrete dentinal tissue; while, as is to be inferred, that which is made is of such imperfect organization, so mottled with uncalcified spots,—interglobular spaces,—as to be rendered quite incapable of resisting that excess of lactic acid found in the secretions coming in contact with it."*

The treatment of a case, such as this instanced, has signification alone from the constitutional stand-point, attributed, as it is by the author quoted, as of relation with scrofulosis and syphilis of hereditary transmission, it is to be perceived that the process of cure is not one of specific character, but rather one of general building up. In these cases no medicine has gained higher reputation than the cod-liver oil, while the use of the salt bath, lukewarm or cold, deserves the highest commendation. Iron and the vegetable tonics are also highly recommended, while beer and wine, graduated in quantity to suit the cases prescribed for, have the commendation of most practitioners. As food is concerned, "it is not well to use too freely of bread, mush, or flatulent vegetables, but the child is to partake freely of meat, eggs, milk, and all nitrogenous diet. Billroth, in discussing the use of preparations of lime, expresses a doubt as to any benefit that may arise from their employment, deeming it not impossible that rachitis may be a condition of digestion in which such preparations may not be absorbed,—which view is, indeed, a common one with American physicians."—KENDALL.

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* Garretson, System of Oral Surgery.

REPLY TO "E."—"Are there any vascular and nervous connections of the dental pulp with the dentine?"

In examining the developing tooth in the jaw of the calf, a pulp, enveloped in its proper sac, yet separated from such sac by that halitus common to human dentition, is seen first to perfect itself into that size and form which represent the crown of the erupted organ. Upon the attainment of this development, this halitus—the analogue of a lymph exudation—has commencing in it, in that portion most closely in approximation with the sac, the processes of organization, the completion of which is found in the deposit of the lime salts necessary to the production of the solid tissue. As organization advances in the halitus, so is there a corresponding atrophy of the pulp, until at length there seems that equality of condition which represents antagonism.

The pulp of a human tooth and the formation of the organ present the same general characteristics; the pulp forever remains distinct from the solid structure, being separated from it by a film of halitus which is the exuded pabulum, and which, so long as the organ retains its physiological condition, is to be found present.

At no point is there any other relation of a pulp to the hard parts of a tooth, except that which pertains to contiguity of structure; such relation of contiguity existing most closely in the cornua, when indeed, from the character of such horns, it seems to be mistaken by some writers as being possessed of the relation of continuity.

The pulp of a tooth does not send nerve fibrillæ to the dentine. Fungiferous filaments are not unfrequently to be found associating pulp and dentine, but such expressions represent the pathological state, the fungus having in all instances its origin from that portion of the pulp most exposed to a source of irritation. In loose dentine parasitic threads, passing from a carious cavity, are occasionally to be observed.—STEELE.

WOODEN PINS IN ROOT EXTRACTION.—The difficulty in extracting the roots of the six anterior superior teeth, where they are deeply imbedded in a heavy alveolar process, and the pulp-chamber enlarged by pivoting or decay to such an extent as to render the alveolar forceps and screws rather inefficient instruments, is within the experience of every operator. It can be greatly facilitated in most cases by removing the soft decay with a *cone bur;* then fitting a round pin of hard wood into the cavity, and if necessary driving it home with the mallet,—the wooden pin, if well adapted, affording strength to the frail walls of the root. This method is especially adapted where only one side of the root is remaining, allowing one beak of the forcep to rest against the wood, which makes it less liable to crush or slip.—J. H. MEASE, D.D.S., *Lebanon, Pa.*

THE

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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

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[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S., in the Office of the Librarian of Congress at Washington.]

(Continued from page 286.)

Having satisfactorily placed the permanent cuspids in position at the normal period of twelve or thirteen years of age, there will now be an interval of considerable, and possibly very great, duration prior to the eruption of the *third permanent molars* (wisdom teeth).

There are no teeth to which so much diversity pertains, in the direction which we are now considering, as the third molars. They have for their normal period of eruption the eighteenth year; but it is usual to find these teeth erupting at any time from sixteen to thirty, and abnormalities extend to the ages of forty or even fifty. We find also that there is usually a great difference between these teeth of the upper and the lower jaw in the ease or difficulty of eruption, and that this peculiarity does not pertain to any other teeth. We find, as a usual thing, the wisdom teeth of the upper jaw erupting in proper position and with very little trouble, but we also have an occasional deviation from this in malpresentation outwardly, more or less decided, until these teeth grow directly into the cheek, producing that great degree of suffering which such a condition would naturally suggest, and for which the remedy is extraction of the abnormally presenting tooth. The lower wisdom teeth are usually much more difficult to erupt, but it is with the decidedly pathological eruption of these teeth that consequences are entailed which frequently have an extent and gravity entirely unparalleled by any others of the permanent denture. In these cases, long before the gums are even ready for lancing, peculiar dull pains are felt externally, though deep seated, at the angle of the jaw; these sometimes dart upward in front of the ear and downward below the ear on the neck; there is sometimes difficulty in opening wide the mouth, and indeed uneasiness even in slight motion during mastication. The cause of all these sensations can only be suspected as probable from the age of the patient (over sixteen, with no indications of lower wisdom teeth), and can only be in the least degree assured by a most thorough *differential* diagnosis (separating this probability from the *possibility* of *any other* existing cause). It can readily be appreciated that nothing within the range of dental pathology could demand greater diagnostic skill than this. As week after week passes, during which the existing trouble is quite liable to diminutions and exacerbations, though these will be remarked as devoid of periodicity, we find at length that uneasy sensations become more "localized," even though they may not increase much in severity; while, on the contrary, they may aggravate somewhat as they localize, until the seat of soreness may be markedly inclosed between the thumb and finger, and some response produced by thus exerting pressure, though it is often even yet quite unsatisfactory that the indications are not more definite. After this annoying condition has possibly existed for some months, we may reasonably expect to find unmistakable signs of the confirmation of our diagnosis in the gradual enlargement, both in width and height, of the gum posterior to the second molar (twelfth-year molar). This enlargement of gum in height soon adds a serious complication, for it either overgrows the posterior portion of the second molar, and is thus wounded in mastication, or it is directly bitten upon by the superior wisdom tooth, which is most frequently in position. Then it is that we may expect the pain to increase in severity with great rapidity; then it is that we may look for *each day's* report of "worse and worse"; the lacerated and highly inflamed gum is of course exquisitely sensitive, the irritation upon the sensory branch of the inferior dental nerve is transmitted to the *otic* ganglion, at which point the sensory and motor filaments of this compound nerve first form a single cord, and from here, by *reflex* action, through irritation of the motor filaments, the motion of the jaw is interfered with until it becomes tightly closed. Meanwhile the swelling of the contiguous parts, both within and without, increases very greatly. Tenderness externally upon pressure, and difficulty of enunciation and deglutition supervene, and also increase, until a touch becomes almost unbearable; enunciation is so thickened as to become sufficiently indistinct to compel written communication in place of verbal, and active deglutition becoming impossible, nothing but the most liquid nourishment can be taken passively into the stomach. As might be supposed, all this local irritation cannot exist for so great a length of time without causing serious symptomatic constitutional disturbance, and thus we find the patient, who is suffering so gravely as has been depicted, in bed, almost completely demoralized, nervously irritable, exceedingly prostrated, with quick and frequent pulse, excessive salivation, high fever, and altogether in as pitiable a condition as can well be imagined. These are the cases which, having progressed until constitutional symptoms have supervened, are then usually placed in charge of the general practitioner, at whose hands, in ignorance alike of the cause of trouble, or even of the possibility of so serious results arising from such a cause, the treatment is simply alleviative and purely from the constitutional antiphlogistic stand-point, and is thus continued until "nature" at last either effects a cure, or, becoming exhausted, the patient sinks.

Treatment.—In the earliest stage of the condition under consideration, when the uneasiness in front of and below the ear, and the dull, deep-seated pains at the angle of the jaw first present, it would be found that very little, if any, relief would be afforded by lancing the gums; we are therefore left to depend upon such general strengthening treatment as would tend to put the system in the best possible condition to resist pain-producing impressions, if such treatment is indicated, and the application externally, at the seat of trouble, of laudanum, spirits of camphor, strong infusion of hops, the well-known mixture of laudanum, tincture of aconite, and chloroform (equal parts), aconitia ointment (aconitia, gr. ij; simple cerate, ʒi), or some one of the various other anodynes used in dental practice; being careful, however, to select such medicament as will not disfigure the patient by either staining or burning the outside of the face and neck. This treatment, together with the occasional administration of a Dover's powder (ipecac., opium, and sulphate of potassa), 5 to 10 grains, or 1 grain of opium or its equivalent of laudanum, or 20 or 30 drops of solution of meconate of morphia, or a teaspoonful of the solution of sulphate of morphia, when wakefulness at night is annoying, will usually enable the patient to endure an amount of duration of infliction without marked loss of strength or spirits, which without this aid would have been productive of considerable discomfort, if not depression. In this way we palliate until such time as more decided localization of pain takes place, and until it is presented clearly to the mind of the patient, through the explanation of the dentist, that the cause of the trouble is undoubtedly the attempt at eruption of a wisdom tooth, when, although it will be a long time before the tooth will actually make its appearance, we may nevertheless give much relief by making the X-incision in the now enlarged gum. It should be told the patient that this operation is not intended as one of cure, and the reasons should be given for this, that the length of time yet to elapse before complete eruption can take place is too great, and that the concomitant irritation is of too much intensity, to admit of the probability of one lancing being sufficient, but that an occasional touch of the lancet, as seems required, will be exceedingly beneficial.

If this should not prove adequate to the emergency, a small pellet of cotton dipped in a paste composed of creasote (carbolic acid), 1 drop; acetate of morphia, 1 grain; taking about $\frac{1}{12}$ to $\frac{1}{20}$ of the grain of morphia upon the cotton, and carefully inserting it in the cut gum over the tooth, will almost always give decided relief.

If, however, the progress of eruption has been permitted until the enlargement of the gum has been such as to have rendered it liable to pressure and laceration during mastication, and the various annoying and painful complications referred to in this connection have consequently supervened, before the patient is permitted to endure further suffering, before the jaws have become markedly closed, and without attempting the experimental treatment of anything less decided, the entire covering of gum should be taken off the tooth, as has been suggested and illustrated when upon the lancing of the gums for severe cases in connection with the pathological eruption of the second deciduous molars. But experience teaches that while this operation for the infant is not very difficult (though not very easy), the same operation for the adult is quite difficult to do neatly and thoroughly, and it is for this reason that we see frequently the operation of lancing for the wisdom teeth indulged in to an extent which simply amounts to cutting the gum in pieces; and this, too, with comparatively little advantage, for the bulk of gum tissue is left, and an already badly wounded gum is left, worse wounded, for further irritation. The instruments needed to perform this operation quickly, neatly, efficaciously, and almost painlessly, are the curved bistoury (already spoken of for ordinary lancing), a tenaculum, and a pair of scissors with the blades curved as nearly as possible at a right angle with the handles.

The gum should be divided by two straight cuts from behind, forward; the first beginning at the posterior and inner (lingual) angle of the wisdom tooth, extending forward to the inner part of the second molar; and the second beginning at the posterior and outer (buccal) angle of the wisdom tooth and likewise extending forward to the outer angle of the second molar. It will now usually be found that a flap of gum can be raised from off the coming tooth, and if this is not absolutely free at its anterior edge, the connections are very easily severed, as the posterior face of the second molar insures an almost divided gum at that place. The flap should then be gently taken upon the tenaculum, the point being first passed as far under the flap as is deemed desirable for excision, and then turned up, thus puncturing and raising the flap; the scissors should then be placed carefully in position, the points presenting outwardly, toward the cheek, and the blades resting just posterior to the tenaculum, and then, being assured that all is just as would be desirable, cut quickly, and thereby painlessly. It is a matter of no moment as to whether the flap is still held by the tenaculum, but it is decidedly important that the side cuts should admit of the placing of the scissors well back, and that they should be well in position before the final cut is made. I have frequently been amused at the satisfied energy with which patients have closed their jaws after the performance of this operation,—particularly, when such closure was an indulgence in which they had not been able to luxuriate during, possibly, many weeks.

But it sometimes occurs that we do not see the patient until after the case has been under general charge for perhaps a period of a week or more, during which time but little progress has seemingly been made toward a desirable consummation ; the various remedies which have been directed for the alleviation of the unknown affliction have failed to give satisfactory results, and, with the exception of that due to the induction of narcotism, no relief has been afforded. The parts about the neck and face have steadily increased in volume and tenderness. A "forming abscess" is the usual diagnosis, and not unfrequently we find that poultices and mustard-plasters have been for some time employed to hasten suppuration. The teeth are almost completely closed, the ability, or even desire, to take nourishment, almost entirely wanting, the breath fetid, the lips peculiarly puffy, the expression that of bloated distress and helplessness, together with a constant and profuse flow of saliva, and a rapidly approaching degree of febrile weakness which to patient and attendants is truly alarming. Indeed, the woeful appearance of things which I have usually, and very frequently, witnessed when called to cases of this kind, exceeds by far that associated with grave disorders in general practice, and it is for this reason that I am thus particular in describing it, and for this reason also that I shall direct especial attention to the removal of these depressing and disagreeable surroundings. The bandages and poultices should immediately be removed and the parts gently and neatly sponged clean with warm water and soap ; after which the first indication is a digital examination, which can usually be made by passing the finger between the cheek and teeth, for the purpose of deciding the location of gum tumefaction and *the absence from position of the wisdom tooth*,—for nearly all the antecedents, *except length of duration*, and nearly all the appearances, which pertain to this severe form of dental trouble, are also found in aggravated cases of alveolar abscess arising from any of the lower molars. Having verified, as far as possible in this way, the presumed diagnosis, the next necessity is the opening of the jaws, at least to a degree sufficient to afford some relief. Even in cases where the possibility of opening, on the part of the patient, is no more than sufficient to introduce a knife-blade flat-wise, it will almost always be found that *steady, gentle* pressure will soon produce quite a decided increase in width. For this purpose many ingenious instruments have been devised, although really nothing more is required than several simple wedges of soft wood, which are pressed between the teeth in gradation of thickness, until from three-eighths to one-half an inch of space is obtained, through which opening an X-lancing can be well enough performed to insure considerable immediate relief. If the process of opening the jaws is accompanied with a degree of pain which induces complaint from the patient, the first resort is that of freely anointing the cheek and adjoining parts, from the condyle to the angle of the jaw, with the aconitia ointment already referred to, using for this purpose a portion equal in size to an ordinary bean. If the weakness and irritability of the patient preclude the endurance of the attempt after this application, it will be found that the use of a gentle battery current—positive, moistened sponge, over the otic ganglion; negative, handle-electrode, in hand of patient opposite to affected side—will be of decided utility. For this purpose I always employ the prime battery current, *automatically* broken. If, as idiosyncratically might be, the sensation produced by the current, though very gentle, is too disagreeable to the patient for the employment of a current sufficient in strength to be obtunding, we then have general anæsthesia as a last resort, which if found necessary should be induced only to that degree which experimentally is proven in each case to be sufficient for the accomplishment of the desired object. It should also be particularly remembered, that unusual care should be exercised in the forcing open of the jaws, when any of the various obtunding appliances are employed, as far less than an amount of violence, which under such condition is inappreciable, would be productive of much subsequent distress. The gum having been temporarily lanced, the mouth should be rinsed with tepid water, with which may be mixed a small portion of phénol sodique, for its disinfecting and soothing qualities, followed, when the hemorrhage has ceased, by a cooling mixture of twenty or thirty drops of eau de Cologne to half a tumbler of water, which is very refreshing. The general surroundings of the patient should now be attended to under direction,—the pillow and bedclothes smoothed, the room ventilated, the paraphernalia of sickness removed, and things generally made comfortable. If practicable, the operation of removing the covering of gum should be performed at the close of the first visit; but if this is not done, the opportunity for doing so, if necessary, should be watched for and promptly embraced, before *secondary swelling* supervenes. As a rule, the result of this treatment is a prompt convalescence, but one or two visits being needed, perhaps none, and with ordinary household supervision in the matters of care and diet the sufferer is soon able to visit the dental office for final inspection. Although the treatment recommended is usually sufficient to afford permanently the desired relief, it nevertheless sometimes occurs that several (four, five, or six) subsequent office visits are found necessary, for the purpose of introducing small cotton pellets dipped either in the paste of creasote and acetate of morphia already referred to, or in the *dental* tincture of iodine (alcohol, ℥j; iodine, ʒiij), between the posterior face of the erupting tooth and the still somewhat overhanging gum. These pellets should be introduced very gently but thoroughly, and if the tincture of iodine is employed, great care should be used that the pellets be small and not more than one-quarter or one-third filled with the medicament, for very slight pressure causes great overflow of the iodine with its consequent disagreeable and prolonged irritation of surrounding parts.

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

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THE face is among the most complex of the regions of the body: its functions are more varied; its connections are more embracing; its lesions are more deceptive,—the brain alone excepted.

The term "face" is employed in two ways. It is that portion of the head other than the cranium; it is the countenance. We speak of the face as lodged beneath the anterior third of the base of the brain, thus excluding the forehead. We say the "forehead is a portion of the countenance," and thus again include it.

A gunshot wound of the face may imply a lesion extending from the skin to the posterior nares,—while a palsy of the face implies an involvement of the superficial parts alone.

Turning to the skeleton for our primary conceptions, we find the face to be that region which protects the visual, nasal, and dental organs.

Now structurally the face is an outgrowth from the cranium. It is seen to arise after three distinct methods,—first, a vertical prolongation from the frontal region forming the nasal bones, and the incisorial portion of the upper jaw. Second, a median prolongation from the base of the skull, creating the ethmoid bone and vomer. And third, lateral processes advancing toward the median line, which form the bulk of the upper jaw and the whole of the lower jaw. But these features, although of importance in the interpreting of malformations, have little practical value.

The face is dependent upon the cranium for attachment and support, but is independent of it in many particulars. It is best to consider it as having distinct mechanical features for its maintenance and peculiar functions. We must not, it is true, forget that it is a part of the skull; neither should we ignore its claims to being a very natural region.

Let us see for a moment how purely mechanical is its union with the brain case. While the face protects the cranial figure at its weakest point, which is the anterior cerebral fossa, it has no real significance as part of it. Every facial bone can be removed, provided we include the ethmoid bone among the cranial bones as is generally done, and the interior of the cranium will not be exposed. The points of union with the cranium are the zygoma, the pterygoid process, and the ethmo-vomerine attachment, posteriorly; and the fronto-malar and the fronto-nasal regions anteriorly. All these may be loosened or destroyed by violence, or the face be entirely removed, and the functions of the brain continue unimpaired.

Considering the face, therefore, as a region *sui generis*, we are first struck with its irregular figure. Externally, in examination of the face of the living subject, the hand passes down over three bony prominences, the supra-orbital ridges, the cheek-bones, and the inferior margin of the lower jaw. On the sides are encountered the zygomatic arch and the angle of the lower jaw. When the skull is examined the depressions between these lines are conspicuous, and the two great cavities, the orbits, are now exposed to view. Internally the face is still more varied. It is divided into two nasal chambers, and each chamber communicates with large spaces in the maxillary, frontal, and ethmoid bones.

But the most remarkable feature of the face is the lower jaw. This is a large, massive, movable lever, articulating with the skull, and operating upon the upper jaw (which is fixed) by powerful muscles. The cleft between the jaws is of no special value except in explanation of the architecture of the face; but when the soft parts are in position it forms the frame-work for the cavity of the mouth.

Every bone of the face is in contact with mucous membrane excepting the malar bone. This will prove to be a valuable point when we come to study its diseases.

We have not yet judged the face by the test which should be applied to every region,—namely, the limitation by relation of function. By this we mean marking out a region by lines which define the function of that region. For example, to call the ear a natural region is to imply that all its important parts are supplied with nerves, vessels, and muscles, having special reference to the acoustic sense. The face thus considered has boundaries very different from those suggested by the skeleton or living subject. Its chief muscle, the temporal, arises from the sides of the cranium. The pterygoid arises from the under part of the sphenoid bone. The digastric arises from the occipital plane, and passes as far forward and downward as the hyoid bone. The internal maxillary artery, in addition to supplying parts we have denominated facial, supplies the tympanum and meninges of the brain.

The relations of the nasal chambers to the upper part of the pharynx, and the oral cavity with the lower portion, makes it impossible to draw any sharp line of limitation between these regions and that of the pharynx. In our lectures on this subject we will assume that a surgical region is, *per se*, a natural one, and to give proof of our convictions we propose in our remarks on the face to include the pharynx, and the neck as far down as the hyoid bone.

It is interesting to observe that the majority of the cranial nerves are distributed to this region. The auditory, pneumo-gastric, and spinal accessory nerves, are alone found within other portions of the body. And it is further not a little curious that the first and last of the cranial system of nerves, although arising from remote points, should be distributed within the same natural region.

The following is the division of our subject:

The Region of Expression.
" " the Temple, and "Angle of Lower Jaw."
" " " Ear.
" " " Upper Jaw.
" " " Nose.
" " " Mouth.
" " " Tongue.
" " " Naso-pharynx and Palate.
" Spheno-maxillary Space.
" Supra-hyoid Space.

I.

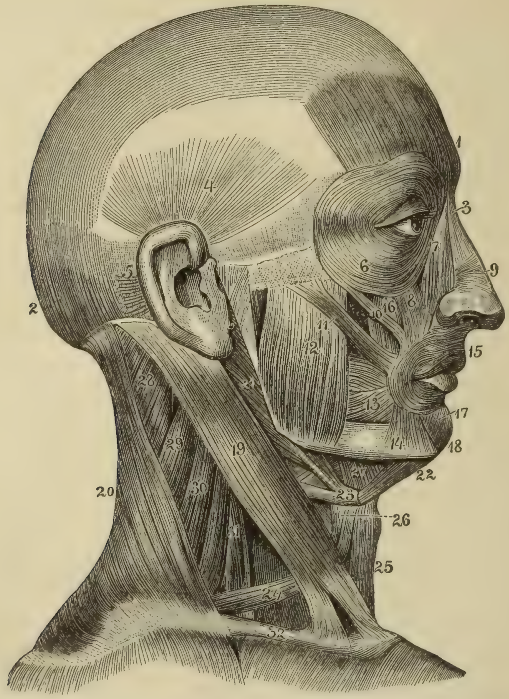
THE REGION OF EXPRESSION.

We will speak of expression from the stand-point of the factors of expression,—the muscles. These produce either active or passive expression. The former is due to muscular action, the latter to general tonicity of the parts. There is an expression in the features in repose, which yields nice shades of distinction. The emotions have made their own record in the lines of the face (best seen in repose), which are only momentarily disturbed by any tricks the parts may have learned.

Wrinkles are caused by the superficial muscles being intimately united with the connective tissue and skin. A contracting muscle must perforce break up the skin over it into a number of transverse folds.

Healthy children with rotund cheeks have no wrinkles; but in the subjects of hospital marasmus (the scourge which annually sweeps away so many of our foundlings) the face becomes wrinkled like an old man's. We hold that, when the nutrition is fair, the study of the wrinkles gives us a guide to the position and meaning of the muscles, and we propose to invite attention to some of them. While we speak familiarly of faces "wrinkled with care," we shall see that

Fig. 1.



the expression of the more pleasing emotions begets by far the greater number.

The region of expression is limited above by the frontal eminences, at the sides by the cheek-bones and by lines drawn thence to the lower jaw. The lower boundary of the region is defined by the chin. Within this space are found all the facial muscles proper. They are easily associated in the mind, since they are supplied by the same nerve.

The muscles of the face are nineteen in number, and are divided into three groups, as follows:

(1) The fronto-palpebral group, including the frontal portion of the *occipito-frontalis* and *pyramidalis nasi*, the *orbicularis palpebrarum*, and the *corrugator supercilii.*

(2) The nasal group. This comprises the several muscles about the nostrils. They serve to dilate or contract these openings. They are quite unimportant, and need not take our attention at this time.

(3) The oral group, including the *orbicularis oris* and the muscles inserted into it.

It is a noticeable fact that when muscles have delicacy of function, and denote peculiarities of the individual, they are subject to great variation. Such are those found in the face and the interior of the larynx. What muscles excel, in mobility, those of the countenance? or, in their combinations, those which control the voice? Their phases of form, while interesting to the physiologist, are confusing to the anatomist.

If it had been part of our plan, we could give many examples of variation in the muscles of the face, but as they are of no practical importance we must pass them by. It is well to remember, in reviewing any arrangements of muscles by regions or layers, that the regions merge and the layers interlace. We must rest content with an arrangement which preserves harmony with familiar phenomena, while it is one easily remembered. We claim for our own a greater simplicity than Gray's, in which five distinct regions—viz.: the palpebral, nasal, superior maxillary, inferior maxillary, and inter-maxillary—are made; and greater consistency than Henle's, where the occipito-frontalis and orbicularis-palpebrarum are removed from the facial muscles.

THE FRONTO-PALPEBRAL GROUP.—The frontal portion only of the *occipito-frontalis muscle* (1) belongs to this group. The small posterior portion (2) is, physiologically, a distinct muscle operating upon the epicranial aponeurosis from behind. The frontal division is flat and thicker below than above. It consists of a median and two lateral portions in function, although the scalpel can demonstrate but one continuous layer. The median portion passes from the center of the forehead to the bridge of the nose, where it has been described as the pyramidalis nasi. It is, however, in no way a distinct muscle. The *origin* of the median portion in truth is from the nasal bones,—the *insertion* on the epicranial aponeurosis. The lateral portions may be said to arise from the last-named structure, and to be inserted into the brows beneath the orbicularis. The outer fibers are short, and are gradually lost upon the superficial temporal fascia.

The *orbicularis palpebrarum* (6) is comprised of two distinct portions,—the palpebral covering the lids, and the orbital surrounding the edges of the orbit. The palpebral layer arises from the palpebral ligament, and describes its ellipse entirely upon the lids. The orbital layer describes a larger curve. Its inner or nasal border is fixed to the bones about the corresponding orbital edge, where some of its fibers pass upward to the forehead, and a few less powerful fibers are lost in the elevators of the lip. Its outer and inferior edges are free. The fibers entering into the brow are short, curved, and compact; those overlying the cheek are more sweeping, and exhibit a looser structure. The intimate association of the upper and inner portion of the orbital division of the muscle with the frontal is at once seen when we come to study its functions.

The *corrugator supercilii* is generally described as a distinct muscle.

It arises from the frontal bone, and is inserted a little above its points of origin into the orbicularis.

Now the two last-named muscles are strictly symmetrical, and can be separately contracted. We believe, to properly understand their actions, it becomes necessary to view the frontal muscle as we have proposed, reserving each lateral portion to the orbicularis and corrugator of its own side, and the median portion to a group of fasciculi acting separately.

When both lateral portions contract, the brows ascend, and the space between them is slightly widened. The brow is broken up into transverse wrinkles, which are more numerous at the sides than in the center, and are convex upward,—*i.e.*, concentrically with the curve of the brows. The wrinkles that form in the median space of the forehead do so perforce of the lateral contractions. The wrinkles here are generally but two in number, and are concave downward,—concentrically with the line of growth of the sparse hair of the inter-orbital space. In the forehead of the aged in repose, one sees three sets of wrinkles—a symmetrical set of the first division, small and numerous over the frontal eminences,—and a single median one composed of U-shaped lines.

When the brows are raised, and an effort is made to adduct them, they do not approach on the plane of their elevation, but at an angle downward and inward. This is caused by the corrugator supercilii muscles. The outer wrinkles now scarcely at all appear; the median ones persist, and a new set are seen at an angle to the last over the inner portion of the brow. These may unite with the transverse ones, and form what Mr. Darwin, in his "Expression in Man and Animals," has called the rectangular folds. But it has already been seen that the vertical member of the folds tends to be oblique by virtue of the corrugators, and the transverse ones are concave downward. Some individuals can attain in this act a higher degree of perfection than others; but with most the tendency to adduction overbalances the elevation of the inner extremity of the brow. In that event the internal orbital space is ridged by the approach of the brows into a single broad vertical fold, with two smaller ones at its sides. This is the frowning act, and is intensified by a transverse depression at the root of the nose.

At the stage when the brows are elevated, as above described, in order to demonstrate the rectangular folds, a powerful effort is made to act upon the median fibers. The median wrinkles can be made to deepen, and the fibers, therefore, contract with depression of the brows, thus demonstrating their capacity to draw the scalp forward, while the outer fibers are already tense in keeping the brows elevated.

Mr. Darwin considers that "the central fasciæ of the frontal muscle are the antagonists of the pyramidal, and if the action of the latter is to be especially checked these central fasciæ must be contracted." (Ibid., p. 190.) We cannot consider the pyramidalis as a distinct muscle from the frontal. The appearances already described can be explained without seeking for an antagonism between the median division and any muscles placed below it.

The action of the *orbicularis* is divided into the act of closure of the lids, and the adduction of the outer free edge. If in a dissection the skin about the eye is carefully removed by making an incision along the outer margin of the frontal muscle, and the orbicularis muscle with the former turned forward as one layer, we will observe as we approach the orbit a few fibers of attachment of the ciliary portion upon its outer margin. The contraction of the ciliary fibers between this attachment and the palpebral ligament must assist in depressing the upper lid. But with this exception the orbicularis has no connection with the outer orbital edge.

When the entire muscle is contracted to its utmost the brows descend, and are adducted as in frowning,—the motion ensuing from the outer toward the inner side. The changes in the skin caused by the act, in addition to those already seen in the brow, are first a depression below the inner canthus, extending to the fulness of the cheek,—a number of small vertical folds in the lower lid at the outer canthus,—a large number of wrinkles placed radiately to the outer malar portion of muscle from about the end of the brow around to the fulness of the cheek, making the old woman's "crow's-foot." The upper eyelid is depressed by the palpebral fibers; the lower eyelid is elevated by the general orbicular contraction.

If the skin over the face be watched during the orbicular contraction, the eminence of the cheek is seen to move lightly upward and inward. This is greater in some individuals than others. We have frequently seen a prominent vertical fold of skin lie between the side of the nose and the cheek fulness. If this fold is in a line with the elevators of the upper lip, and when the contraction is excessive, as in the attempt to separate the lids slightly while endeavoring to discern an object in the heavens at bright midday, the elevators themselves are induced to contract, and the upper teeth are disclosed.

From the extent of the outer fibers of the orbicular portions of the muscle we find that the points of origin of the zygomatic muscle and elevator of the upper lip are concealed. In certain diseases of the malar bone the orbicular fibers may become fixed, and imperfect contraction of the muscles surrounding the eye ensue. A case of a boy who had suffered from strumous caries of this bone recently came under our notice, which was remarkable for a depressed cicatrix over the malar prominence, and a retraction downward and outward of the lower eyelid. It was proposed to introduce a tenotome beneath the skin at the side of the depression, and by removing the point of tension to restore the parts to their normal position. To this, however, the parents of the boy would not consent. There was every prospect of this procedure relieving the lad of a deformity. In cicatrices the results of burns of the face, the eyelids are often distorted from a similar cause to the above. In cases of gunshot wound of the face in which the ball has entered at the malar bone, the retraction of the skin and the orbicular fibers invariably produces the same malposition of the lid. The surgeon is often called upon to relieve the spasmodic contractions of the orbicularis, which come on as a result of prolonged conjunctivital irritation. A method often resorted to is to freely divide the malar fibers of the orbicularis, on a line with the external canthus.

The lower eyelid is free from fat. The connective tissue beneath the delicate skin is abundant. In many persons at middle age the lids sag, and become slightly œdematous. In the ecchymosis following a blow upon the eye, the blood collects in quantity in this loose baggy structure. In operations upon the lower eyelid the same tendency is seen. The "black eye" following the removal of a small tarsal tumor is often, for this reason, of unexpected annoyance to the patient.

(To be continued.)

TREATMENT OF A CASE OF IRREGULARITY.

(Read before the Odontographic Society of Pennsylvania.)

BY JOSEPH RICHARDSON, M.D., D.D.S., TERRE HAUTE, IND.

GENTLEMEN,—In the November number of the DENTAL COSMOS, an illustrated case of dental irregularity is given, the models of which were presented by Dr. Gilmour at the September meeting of the Society, for the stated purpose of eliciting advice of members in regard to the best mode of treatment.

A few days previous to the receipt of the journal, I had entered upon the treatment of a case which, as will be seen by comparison of the cuts, presents the same general features as the one given by Dr. G.* Availing myself of the privileges of a corresponding member, I offer the case, with its treatment and results, for your consideration. There is nothing in the mal-arrangement of the teeth in question that is phenomenal, nor indeed unusual; and my chief purpose in reporting it is to give to the profession an extremely simple method of treatment, applicable to a great variety of cases of dental irregularity.

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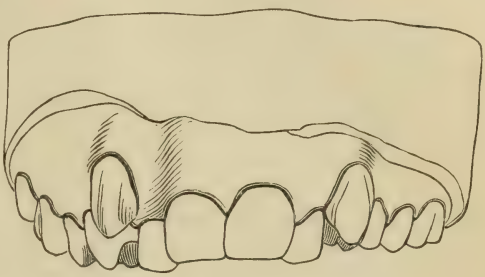
* The cuts illustrating this article may at first sight suggest the thought of a similarity with that of the case of Dr. Gilmour, published in the November number of the DENTAL COSMOS; but a careful comparison will show that the occlusion in the case of Dr. Gilmour was so entirely different as to make the cases very unlike.—A. B., *Sec.*

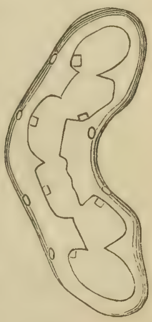
The nature and extent of the malplacement of the lateral incisors and cuspidati in the case under consideration are sufficiently indicated in the accompanying cut, Fig. 1. There is some lateral contraction of the arch, and a rather marked projection of the upper front teeth beyond the lower. The subject is a miss, between twelve and thirteen years of age, of somewhat delicate organization, spare habit, and of predominant nervous temperament. As there was plainly inadequate room in the arch for a corrected denture, the anterior bicuspids were extracted, a procedure which not only afforded ample room in the arch for the misplaced teeth, but made it possible to carry all of the teeth anterior to the second bicuspids backward, effecting a nearer approximation of the upper and lower incisors, and a corresponding diminution in the projection of the upper lip.

Fig. 1.



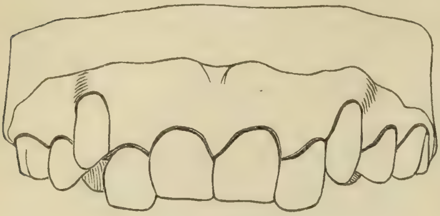
After the extraction of the first bicuspids, a narrow band of vulcanized rubber (Fig. 2) was constructed, embracing the six anterior teeth. Pressure was made upon the misplaced teeth by means of wooden pegs inserted in holes drilled through the band, at such points as were indicated by the direction in which it was desired the teeth should take. In the present case the pegs rested against the posterior mesial angles of the lateral incisors in such a way as to force them, when the band was applied, outward and backward, while those inserted into the opposite or labial portion of the band carried the cuspidati backward and inward. These pegs projected but slightly at first, and were lengthened from time to time, as the teeth moved, their removal and replacement being but the work of a few minutes. Before applying the band, all connecting partitions of rubber were divided, and the band cut away sufficiently at necessary points to enable the teeth to move in the desired direction. In most cases this band may be removed and replaced by the patient for the purpose of cleansing the teeth.

Fig. 2.



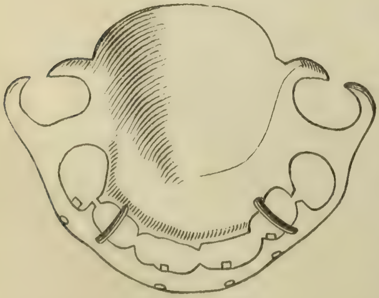
The mechanical action of this simple fixture is readily apparent. The band, when applied, being forced apart by the intervention of the pegs, acts, by virtue of its elasticity, as a clamp, or compressor, forcing the teeth in a direction opposite the insertion of the wooden pins. The band in this case was first applied on the 4th of last November. On the 28th of the same month the cuspids had fallen far enough back to let the lateral incisors take their place within the circle of the centrals, as shown in Fig. 3. I found the case now complicated with a marked elongation of the lateral incisors. This was in part *accidental*, by reason of inflammatory thickening of the investing membranes, and partial luxation, induced by the forces applied to these teeth, but not wholly so, since the following fact clearly indicates that it was in part also *absolute*, namely, that in applying force to their cutting edges in the manner hereafter described, the disparity in length between the centrals and laterals was about half-way overcome in from twenty-four to thirty-six hours, the teeth becoming at that point apparently fixed and immovable, requiring afterwards the application of the same force for some twenty-four days, without intermission, to effect the same degree of shortening, indicating unmistakably the absorption of bone and deepening of the sockets.

Fig. 3.



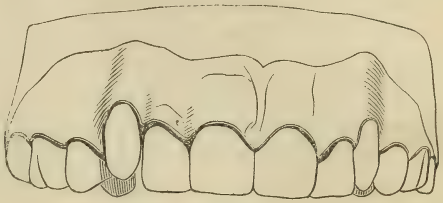
Without any published precedent, so far as I am aware, I entered upon the novel undertaking of shortening (relatively) the elongated teeth in question, by pressure applied on a line with their long axes. To this end, a plate affording fixed points of résistance was constructed, having clasps attached and pinned to the centrals with wooden pegs resting against their anterior, and the plate against their posterior surfaces, as represented in Fig. 4. To this plate firm elastic cords were attached, stretching across the openings for the lateral incisors. When this plate was pressed firmly to its place upon the teeth, and held securely by the means already adverted to, the contractile force of the cords, acting forcibly and persistently upon the cutting edges of these teeth, produced the requisite shortening (as seen in Fig. 5) in twenty-six days from the date of their application. During this time pressure was also being made upon the cuspids, which, in addition to forcing them further backward and inward, assisted in fixing the plate in aid of the shortening process.

Fig. 4.



The shortening of the laterals accomplished, the treatment was thereafter directed to the cuspids, forcing them backward and inward, until the result shown in Fig. 5 was attained. Having brought the latter within the circle of the anterior teeth, I was content to trust the matter of their ultimate elongation to the corrective forces of nature.

Fig. 5.



Finally, a plate was made, resting accurately against the posterior faces of the central and lateral incisors, and cut away somewhat posteriorly to the cuspids, to enable the latter to drop down until they shall become symmetrical in length with the adjoining teeth. The case was dismissed January 30th.

The efficiency of the band contrivance has been amply demonstrated in my own practice in cases much more intractable than the one here related, and I confidently commend it as the most simple, practicable, and thoroughly efficient means of correcting a very large class of dental irregularities with which I am acquainted.

A RARE CASE IN PRACTICE.

BY MRS. H. HIRSCHFELD, D.D.S., BERLIN, PRUSSIA.

Some weeks ago a young lady, of the age of twenty, presented herself at my office to have her teeth attended to. In a few sittings the incisors were finished, and I proceeded to the second superior right molar. This had a large cavity, but it was desirable to save it, as it was the only superior molar she possessed, the lower being in comparatively good condition. This molar had been filled two years previously with amalgam, but this was subsequently lost. On inquiry, the lady asserted she had never experienced painful sensations in it, the constant collection of food being the only unpleasant thing about it.

On cleaning out the cavity, I found without difficulty the openings to the anterior buccal and palatine roots. The posterior buccal root was perfectly closed, as with a layer of dentine. A few turns of the burr-drill revealed the canal, from which exuded one small drop of blood, but with an entire absence of odor. This was remarkable, as the other two roots contained the gray offensive matter usually found in canals of dead roots. Entering this canal with a thin-pointed instrument, I found it penetrated farther than to the apex of the root. Fearing that injury might result to the surrounding tissues, I took a fine silver probe, with a rounded end, and gently forced it up. To my great surprise it ascended in a slanting direction to the extent of eight centimetres, or nearly three inches, without obstacle or sensation to the patient. Had the root pierced the antrum, as frequently occurs, the direction of the probe would have been a straight one, and could not have been two inches before reaching the floor of the orbit.

At this visit the cavity was closed with cotton and sandarac, and time allowed for the collection of secretions if any existed. At an examination three days subsequently, I found the tooth in exactly the same clear condition. By placing the probe on the external cheek and on a skull I found it must have been up in the temporal fossa. I could not think of filling that canal,and desired to extract the tooth, but this the patient decidedly refused. I then placed cotton and sandarac in the two first mentioned roots, closing the cavity with Hill's stopping, with directions to have it removed upon the occurrence of unpleasant sensations. I have not seen her since.

It would be very interesting to me to learn if any of my professional brethren have met with a similar case, and to know the final results.

PROCEEDINGS OF DENTAL SOCIETIES.

HARRIS DENTAL ASSOCIATION.

The sixth annual meeting of the Harris Dental Association was held in Lancaster, Pa., May 1st, 1873.

There was full attendance of the members, and unusual interest taken in the proceedings. The new officers elected for the ensuing year were:

President.—J. Z. Hoffer, Columbia.

Vice-President.—J. L. Hill, Gettysburg.

Secretary.—Wm. N. Amer, Lancaster.

Treasurer.—A. F. Herr, Lancaster.

Executive Committee.—Drs. McCalla, Hickman, and Worrell.

Delegates to the State Society.—Drs. Heiges, of York; Moffitt, of Harrisburg; Long, of Churchtown; McKissick, of Reading; and Worrell, of Marietta.

Alternates.—Drs. Weltmer, of Litiz; and Zell, of Elim.

On motion of Dr. Hertz, the following committee was appointed to make arrangements for a collation for the State Society at their annual meeting in July next in this city: Drs. Hertz, Hoffer, McCalla, Welchens and Amer.

Dr. McCalla offered the following resolution, which was adopted:

Whereas, The Goodyear Dental Vulcanite Company have, for a number of years past, pursued a course of conduct toward the dental profession which is looked upon as unjust and in the highest degree oppressive; *And whereas*, the Harris Dental Association has been untiring in its efforts to explode this monster monopoly, but have failed for want of the necessary co-operation on the part of the profession; *Therefore, resolved,* That this association hereby expresses its high appreciation of the efforts now being made to prove the invalidity of the so-called Cummings Patent, and that the dental profession of this country owe a debt of gratitude to Dr. S. S. White, of Philadelphia, for the manly stand he has taken in this controversy.

The reports of the officers were read and referred, showing the society to be in a highly prosperous condition.

The retiring President, Dr. Martin, delivered the annual address.

Adjourned to meet at Litiz Springs Hotel.

WM. N. AMER, *Secretary.*

KANSAS STATE DENTAL ASSOCIATION.

THE second annual convention of the State Dental Association was held at Lawrence, on the 6th, 7th, and 8th of May.

Drs. L. C. Wasson, of Ottawa; C. H. Reeder, of Burlingame; Geo. C. Holmes, of Lawrence; and F. H. Wilson, of Parsons, were elected to active membership.

The following officers were elected for the ensuing year:

President.—W. F. Griswold, of Leavenworth.

Vice-President.—J. D. Patterson, of Lawrence.

Recording Secretary.—A. H. Thompson, of Topeka.

Corresponding Secretary.—L. C. Wasson, of Ottawa.

Treasurer.—A. Doud, of Olathe.

The following standing committees were appointed for the ensuing year:

Executive Committee.—A. M. Callahan, C. H. Reeder, and George C. Holmes.

Committee on Membership.—Dr. G. H. Dubois, J. R. Boyd, and A. Doud.

Committee on Operative Dentistry.—Drs. J. B. Wheeler, J. D. Patterson, and L. C. Wasson.

Committee on Mechanical Dentistry.—Drs. A. H. Thompson, A. C. McNary, and S. O. Furman.

Committee of Publication and Literature.—Drs. A. H. Thompson, J. B. Wheeler, J. D. Patterson, and L. C. Wasson.

Drs. W. F. Griswold and J. B. Wheeler were elected delegates to the American Dental Association.

Several very interesting essays were read, which were followed by discussions, in which nearly all took part.

After spending three days very profitably to all, we hope, the society adjourned, to meet at Ottawa the first Tuesday in October next.

A. H. THOMPSON, *Recording Secretary.*

AMERICAN DENTAL CONVENTION.

The Committee of Arrangements would respectfully inform the members of the profession that the nineteenth annual meeting of the American Dental Convention will be held at Saratoga Springs, on the second Tuesday of August (the 12th), commencing at ten A.M.

Messrs. Bresslin, Gardner & Co., of the Grand Union Hotel, have generously tendered their large hall, rooms for committees, etc.; and also their splendid parlors, grounds, and band of music, for our social entertainment.

The town authorities have also offered us a very fine and suitable room for our meetings in the new and magnificent hall recently erected.

The committee have made arrangements for the display and exhibition of dental materials and appliances of all kinds; also, for clinical operations during the entire session. Dentists, manufacturers, and others desirous of exhibiting instruments, materials, or improvements in any department of dentistry, are particularly invited to do so, and to present them as early in the session as possible, and to notify the committee of their intentions, etc.

As August is a very busy month with hotel-keepers, it will be advisable for those intending to be present to notify the committee of their wishes. The committee will see that good accommodations are provided for all who give timely notice, and for others as far as possible; and will endeavor to make this meeting a pleasant and profitable gathering to all. The profession generally are cordially invited to be present.

J. G. Ambler, *Chairman of Com. of Arrangements,*
25 West Twenty-third St., New York City.

AMERICAN DENTAL ASSOCIATION.

The thirteenth annual session of the American Dental Association will be held at Put-in-Bay,—an island in Lake Erie, a short distance from Sandusky, Ohio,—commencing Tuesday, August 5th, at ten o'clock A.M. Steamboats leave Detroit daily at nine o'clock A.M., and arrive at Put-in-Bay at two P.M. Boats also leave Toledo daily (and Cleveland, I think) for Put-in-Bay.

Passengers from either the west or east, on the Lake Shore and Michigan Southern Railroad, or on any of the roads terminating or passing through Sandusky, can take boats for the Island at 9 A.M. and 3 and 7.30 P.M. Passengers on the Baltimore and Ohio Railroad arrive at Sandusky at 6.30 P.M., in time for the 7.30 boat.

M. S. Dean, *Secretary.*

SOUTHERN DENTAL ASSOCIATION.

THE Southern Dental Association will commence its fifth annual session in the city of Baltimore, Maryland, the last Tuesday in July, 1873. The members of the profession generally are cordially invited to attend. The committee of arrangements are making efforts with the railroads to get return-tickets free, and with the hotels for reduced fare.

JAS. F. THOMPSON, *Recording Secretary.*

CHICAGO DENTAL SOCIETY.

AT the annual meeting of the Chicago Dental Society, the following officers were elected to serve during the year:

President.—Dr. M. S. Dean.
First Vice-President.—Dr. C. R. E. Koch.
Second Vice-President.—Dr. D. B Freeman.
Recording Secretary.—Dr. E. D. Swain.
Corresponding Secretary.—Dr. J. B. Bell.
Treasurer.—Dr. J. F. Thompson.
Librarian.—Dr. M. W. Sherwood.

E. D. SWAIN, *Secretary.*

CLINICAL REPORTS.

UNIVERSITY OF PENNSYLVANIA.

SERVICE OF JAMES E. GARRETSON, M.D.,

LECTURER ON SURGICAL DISEASES OF THE MOUTH.

REPORTED BY DE FOREST WILLARD, M.D.

CONSTITUTIONAL DISTURBANCE IN INFLAMMATION.

WE come now, gentlemen, to the study of that part of inflammation which is the associative link between medicine and surgery, and which makes the successful practice of the last so impossible without a knowledge of the great principles of the former. You know that in medicine certain diseases are described as constitutional: of these I may mention gout, rheumatism, carcinoma, tuberculosis; also the exanthemata. By the term constitutional, as here applied, is meant disease influencing the whole system. Now, such constitutional disturbance may, from the very beginning, be general, as in the ordinary idiopathic fever; or it may first exhibit itself locally, as in carcinoma. When, then, we say constitutional disturbance is the result of inflammation, we mean that the morbid action has extended over the whole system.

It is, indeed, evident, on slight reflection, that the issues of life and death could seldom depend on local inflammation but for that wonderful connection between part and part, between the circumference and the center, which we are this morning met to study. The removal of an arm or a leg, the severe injury, or even gangrene, of some external and unessential part, could never be attended by fatal results in so large a proportion of cases, but for laws of the economy to which the investigation of local disease can never lead us. In every inflammation, whether external or internal, these laws are in force; and the history of injuries, apparently the most trivial as regards the parts directly affected, often teaches us the lesson that the human body cannot be regarded as a piece of machinery, in which what is not essential to its working may at any time be destroyed or removed with impunity.

According to the teachings of physiology, there are two channels by which communication is established between all parts of the system. These, as you will at once infer, are the circulatory and nervous systems. It would seem, then, reasonable to conclude that the influence of constitutional conditions in local affections, and conversely of local injury in disease on the system at large, is produced by one or the other of these channels; either, we would say, by some modification of the constitution of the blood, or by some impression on the nervous system.

From the knowledge you have of irritation, we are justified in making here the most simple definition that can be given of constitutional disturbance, by saying we mean fever from a local irritant.

Fever, from the Latin *ferveo*,—I grow hot,—is applied to a condition of the system in which there is increased heat of the surface preceded by a shivering or chilliness, together with more or less excitement of the circulation, the pulse being above the standard in frequency, and also generally altered in other characters. To these symptoms are invariably added derangement of functions, the degree and kind of which vary with the type and stage of the fever, but which are always so extensively distributed, and so marked in character, as to render evident the constitutional nature of the affection. Perhaps the most general of these symptoms is a feeling of debility and oppression, which, with various modifications, mark the whole course of the disease in almost every instance.

If we stop at this point to view the affection more in detail, we find that it usually resolves itself into three distinct stages,—invasion, progress, resolution. The first accession of the disease is marked, in some cases very distinctly, by a rigor, or shivering fit, of short duration; in others, only slightly by chilliness, with a sensation of general and undefinable discomfort and anxiety, which may be distributed over several hours. The surface is pale and rather cold, though seldom in this respect corresponding to the sensations, and often presents the peculiar roughness known as goose-flesh. The appetite is defective, there being sometimes nausea, sometimes mere indifference to food. The pulse is small and frequent, and a sensation of weariness combines with some degree of soreness in the muscles to render exertion oppressive and painful. From this stage springs the second—fever.

At the termination of this second stage, moisture returns to the skin, and frequently, upon perspiration, breaks out. The other secretions at the same time increase. The urine, which has been scanty and high-colored, throws down a copious sediment, the pulse gradually subsides to its natural standard, the appetite returns, and all the symptoms disappear. In these phenomena, which are common to all well-marked fevers, we may observe the presence of an altered state of almost all the important functions, derangement of the nervous centers being indicated by the peculiar febrile sensation and prostration, often with increased sensibility and general pains, the circulation being altered as regards the character of the pulse, digestion in abeyance, secretion much diminished, while the nutritive and respiratory functions seem to expend themselves in the production of increased animal heat, the tissues gradually wasting away under the influence of the disease.

Such is the nature of fever. As a purely idiopathic affection, its lesion is undiscoverable. As it occurs in the practice of the physician, it is often found to exist without any organic lesion which is discoverable after death. But it is as surgeons that we have met here to consider it. And this fever, as I have described it, is what we call constitutional disturbance, or inflammatory fever. Now this fever, as it is met with by the surgeon, is generally secondary to some lesion, which, as a primary, he comprehends; but it sometimes is the very first thing which has attracted attention, as, for instance, in such cases as latent inflammation. Here we see it as a symptom of a primary lesion, so here we call it symptomatic fever.

Fever then, as it falls under the attention of the surgeon, must be viewed from four stand-points: 1. Simple idiopathic fever; 2. Inflammatory fever; 3. Typhoid fever; 4. Irritative fever.

Inflammatory fever.—This presents every feature of the febrile condition in a very marked form. The premonitory symptoms of coldness and shivering are usually very decided, but they are not of long duration, and are succeeded by a state of reaction, in which the accelerated and hard full pulse, thirst, and increased heat of surface are so great, in comparison with the other symptoms noticed, as to indicate excitement of the sanguinous system as the most prominent characteristic of this type of fever. The secretions, and even the appetite, may vary little comparatively from the normal condition, and accordingly the exhaustion and emaciation produced in a given time are much less than in other forms of which I will presently speak. The fever is eminently one of strong reaction and vascular excitement. It presents few fluctuations or remissions; its accession and crisis are usually very distinctly marked, the latter being accompanied, in the great majority of cases, by sweating; and the return to health is usually satisfactory and rapid when the cause of the disease has ceased to act.

It is to be recollected, however, that there is no absolute line in nature between this and any other type of fever; and that, moreover, the purest inflammatory fever, when protracted beyond a certain time, is sure to undergo alteration into some other and more fatal type of febrile disorder.

Inflammatory fever begins with the symptoms of depression, as already mentioned; the patient feeling much discomfort, and yet unable to specify his ailment. A rigor, a fit of shivering, is followed by a sensation of much heat over all the surface; this is the harbinger of reaction, and this is the expression of the type of the fever. Do you not see how plain it is? Inflammatory fever is the fever of a process of reaction.

And here, understanding as we, I trust, so well do, this process of reaction, here is the point to crush by one blow, or by a series of therapeutic blows, the disease; here is the place for antiphlogistic remedies,—bleeding, cathartics, diaphoretics, sedatives, etc.

This constitutional disturbance, as it exhibits itself in inflammatory fever, associates itself with and influences all the functions of the system. There are dull aching pains in the loins and limbs; there is restlessness, and with much discomfort a variety of postures is practiced in vain search for ease; both the will and power of exertion are diminished; anxiety and foreboding of evil is felt, and its expression is given by the features. The head generally is hot. At first special sensation is exalted, by and by the intellectual functions are more or less disturbed, ultimately delirium is established, and coma may ensue; the face is flushed, the eyes suffused, the skin hot and dry. Thus we have the nervous system involved. Next we may consider the vascular system. Here disorder is chiefly indicated by the pulse. It is increased in frequency, ranging from 80 to 130 or more, and the heart's action is proportionately accelerated. The pulse is hard, rolling like a cord under the finger, and yielding but little to its pressure; the arterial coats are exercising an increased tonicity, and resist the sanguinous impulse; usually, also, such resistance is unequally exerted at different points, causing irregularity of movement in the artery, and thus a thrill or jar is imparted to the finger. There is increased fullness, as if the vessel were itself enlarged, and held a larger quantity of blood at each impulse; the heart is acting not only more rapidly, but more powerfully than in health. Such are the characteristics of the inflammatory pulse,—frequency, hardness, thrilling, fullness. The three first are seldom absent, but the last may be wanting, and the pulse may be small instead of full. This modification is chiefly observed in serious inflammatory affections affecting important internal organs, more especially those situated in the abdominal cavity, and hence it is sometimes in practice termed the abdominal pulse, the artery resembling a hard, thrilling thread, rather than a cord. This pulse always exists in connection with great nervous depression and debilitated rapid cardiac movement. In affections of the brain, on the other hand, producing coma, the pulse is slow and full, the suspension of cerebral influence appearing to diminish the rapidity without affecting the force of the heart's action. There are idiosyncrasies also to be taken into account. The natural pulse may be slow or rapid, say 50 or 90, and this must be allowed for when previous inquiry has satisfied us that the patient is the subject of such peculiarity.

The function of respiration is quickened, the breath is hotter than usual, and an oppression is complained of in the chest.

Digestion is impaired. The tongue may vary in its appearance. It may be loaded, white or moist, or the edge and central tips may be red and dry; the latter is probably the most frequent combination. In peculiar, and, as they are called, typhoid cases, when depression is great and the nervous system much engaged, the tongue is dry and of a brown color. There is thirst, usually very troublesome, with nausea, loss of appetite, sometimes vomiting, and often tenderness of the epigastrium; the bowels are constipated.

The secretions and excretions in general are materially diminished; the bowels, we have seen, are constipated, mainly from want of mucous secretion from their lining membrane. The skin is hot and dry; the mouth is parched, the urine is scanty, high-colored, generally acid, sparingly aqueous, and holding much saline matter, with comparatively little urea, in solution.

Nutrition is interrupted; so is assimilation. As the fever advances, so does emaciation, and strength is more and more impaired.

Such are the ordinary symptoms of inflammatory fever. The more intense the action and the more important the part involved, the more rapidly and formidably are they developed. They also vary with the temperament of the patient. They may remit, and, as I have before remarked, they often do, being at one time increased and at another mitigated, but they never intermit, being here like the local trouble.

Having reached a certain point of intensity, the symptoms may decline, just like the local action which caused them. The pulse becomes less hard and frequent, the heat and thirst diminish, strength and appetite begin to come again, and the secretions reappear. Not unfrequently such amendment is ushered in, if not at least partially caused, by sudden and great exaltation of the secreting functions, so marked as to be called critical. The patient is bathed in a profuse and sustained perspiration, or diarrhœa occurs, or the urine flows copiously, more aqueous, less saline, at each evacuation less and less colored, and, on cooling, letting down a large amount of sediment of a brickdust color. Thus it is seen that the expressions of the urine become important to the practitioner,—scantiness, concentration, and want of deposit denoting persistence of the symptoms, profuse flow and copious sediment declension; or a discharge of blood takes place, it may be from the rectum, the mouth, or the nose, according to the part affected. This is not to frighten the surgeon; he is to forever bear in mind the possibility of these critical discharges, and he is not to interfere with them unless there seems the most marked occasion for such interference. His duty is to watch. Such critical discharges are usually preceded by rigors and exacerbations; here, too, let the surgeon beware of officious meddling.

But these, instead of declining, may increase, and, combining persistence with intensity, may cause a fatal result. You know protracted exercise exhausts the irritability of a muscle, which then ceases to obey its stimulus. In like manner, excitation of the general system, if both great and prolonged, is certain to wear out the powers of the system, and the patient must sink in consequence.

Or the symptoms neither decline nor advance, but undergo change, merging into that which we have considered as the chronic state in inflammation. The fever here becomes hectic, and, if the local disease still runs on, it sinks to typhoid.

We pass here, then, to a consideration of the *typhoid* condition. This name is applied to a type of constitutional disturbance or fever, differing from the inflammatory in the minor amount of reaction, in the greater degree of prostration of the nutritive and secretory functions, and characterized above all by very marked disturbance of the brain, and secondarily of the entire nervous centers. As might be expected from these characters, it is a very formidable affection. The functions most important to life are deeply involved, and if the fever be protracted a fatal termination is certain, either by complete sinking of the circulation and animal heat, or by deepening stupor with oppressed respiration, or, as is not unfrequent, by a combination of the two conditions.

In its purest form, typhoid fever probably never occurs except in consequence of some cause of a peculiar and specific nature, and it has generally been ascribed to the entrance into the blood of some poisonous substance known or unknown. This view seems borne out by the fact that several of the animal poisons have the power of producing this condition of the system in a very aggravated form. Typhoid fever, when occurring as the original type of constitutional disturbance, is ushered in like the inflammatory type by premonitory chills and shiverings, and by a feeling of general discomfort; but its near approach is often very gradual, and the premonitory symptoms are extended over several days. There is, moreover, a much less violent and rapid change from this stage to that of reaction than in inflammatory fever. Again, the reaction, when established, is characterized by a peculiar appearance of oppression and torpidity of intellect: the eye is dull and suffused, the muscular strength is very much depressed, and the heat of the surface is only slightly raised,—often scarcely above the natural standard. The pulse is accelerated, but does not commonly number above one hundred, and after the disease has made some progress the pulse becomes very soft, and sometimes small, affording a marked contrast to the full, hard, and bounding pulse of inflammatory fever. The tongue, which in the beginning resembles that of inflammatory fever, becomes, as the disease progresses, more and more dry, the white fur on its surface changes to a thick brown crust of the color of mahogany, dry and leathery to the touch, and presenting transverse and longitudinal cracks and furrows. The teeth and gums are likewise not unfrequently covered with brown sordes, the appetite is completely prostrated, but thirst is not always marked.

But, of all the symptoms, the most marked and important are those connected with the nervous system. In the beginning of the fever, disorder of the cerebral functions is chiefly observed in the sluggishness and oppression before noticed; the patient seems abstracted and fanciful, his mind being equally incapable of continued activity or repose. There is usually some headache, but very often no complaint is made unless questions are asked. In severe cases there is more or less complete sleepiness, but in almost all sleep is disturbed and full of dreams. When to this is added incipient mania, the affection is assuming a formidable aspect. At first the delirium is chiefly observed at night; it may be active and furious, but most commonly has the form of unintelligible muttering,—typhomania, as it is called, from which the patient may be easily diverted by speaking to him; relapsing, however, to his former condition on cessation of such external stimulus. In the advance of the disease delirium becomes more constant and more incoherent; the mind cannot be so readily recalled; there is perpetual restlessness and disposition to rise from bed. Hearing may be still acute, perhaps too much so, but the eyes are either ûnobservant or perpetually wandering; they become still more suffused, and the pupil is either natural or, in the worst stages, contracted, as if from opium. A remarkable phenomenon of this stage is suppression, or scantiness, of the urinary secretion, and consequent presence of urea in the blood.

Meanwhile, perversion of other functions continues, the nutritive processes are totally in abeyance, and there is progressive emaciation, giving sharpness to the features and prominence to the angles of the bones throughout the body; all reparative action ceases, the discharges from wounds dry up, and, on the other hand, new wounds are apt to form by sloughing or ulceration over prominent points, as trochanters, scapulæ, sacrum. The tongue continues dry. Sweating, if it takes place at all, is apt to be profuse and exhausting; not critical, but very fatal in its tendency. The pulse is much reduced in fullness and force, very rapid and soft; sometimes intermitting. These symptoms usher in complete prostration, which may prove directly fatal.

Another, and perhaps more common, cause of death, is continuance of prostration, with coma. The irritability of the nervous system has become completely exhausted, and it has passed into comparative repose; but this repose is not restorative, but destructive to life. The delirium ceases altogether, or becomes gradually supplanted by increasing torpor, the breathing is stertorous, the stools and urine are passed involuntarily, the pupils may be more or less dilated, and insensibility is complete. Slight restlessness may continue, but the symptoms are purely automatic in character, the fingers being employed in picking the bedclothes, the lips in forming inarticulate sounds or in confining the breath, which passes slowly and noiselessly, puffing out the cheeks in expiration. These signs portend approaching dissolution; respiration becomes slower and slower, and finally ceases, and the heart's action is suspended either simultaneously or very soon afterwards.

On the other hand, return to health may take place at any period of the affection, and is denoted by the gradual subsidence of the pulse, together with moistening and cleaning of the tongue, and above all, by cessation of delirium and the occurrence of sound, natural sleep. The skin becomes moist, but there is seldom critical sweat, as in inflammatory fever; and the more protracted the disease has been the less is the tendency to a distinct crisis by perspiration or other critical discharges.

This affection, then, is another of these constitutional disturbances, the offspring of some local inflammation. It may present a marked and pure form from the beginning, but more commonly, as suggested, it supervenes upon the more inflammatory form. When this is the case the transition is so gradual from one to the other as to seem to mark them as varieties of the same process.

We pass next to *hectic fever.* The preceding types of fever, though they differ from each other in many points, are alike in their continued character, febrile excitement remaining present throughout the disease, and subject to no remission, or only to remissions and exacerbations so slight and ill defined as not to form a characteristic symptom of the affection.

Hectic fever is distinguished from both by its frequent remissions and exacerbations, usually periodical, occurring once and sometimes twice in the twenty-four hours; by the sweating which attends the paroxysms, causing great exhaustion and emaciation, and also by frequent recurrence and long continuance of the febrile state, without that marked disorder of the assimilative or nervous functions which accompanies continued fever of similar duration.

Hectic fever is invariably connected with some severe organic disturbance or change of structure, and is the form of constitutional disturbance which most constantly accompanies profuse suppuration, especially in an important internal organ. It is under such conditions also that it assumes its most characteristic aspect, and has the most distinctly periodic exacerbations and remissions. When it is fully formed, in the course of such local affection, the patient has usually at least one daily paroxysm or febrile exacerbation, often preceded by chilliness, if not by shivering, and attended by great heat of skin, flushing of the face, and burning sensations in the palms of the hands and soles of the feet. The pulse is frequent, but irregularly so, and usually subject to quick excitement by exertion, food, emotion, or any disturbing cause; it is scarcely ever hard and full, like the pulse of inflammatory fever, nor so small and compressible as the pulse of typhoid, but holds a middle and variable place in these respects, according to the degree of exhaustion of the subject and the amount of febrile reaction. This state does not last more than a few hours, and then subsides by critical sweat, so profuse and exhausting as to be justly termed colliquative; or the sweat may be suspended by diarrhœa, which is even more dangerous to the system. The urine does not differ from inflammatory fever. The tongue may be a little dry during the paroxysm, which is accompanied by great thirst, but becomes moist again as soon as the fit is over. The eye is free from suffusion, and flushing of the face is usually limited to a spot in the center of the cheek, the color of which contrasts strongly with the surrounding pallor.

The febrile paroxysms occur almost invariably towards evening, reaching their height about midnight, and passing into the sweating stage early in the morning. The intervals in the early stage of the affection are not unfrequently entirely free from fever; occasionally, however, there are slighter exacerbations, sometimes irregular in character, often seeming to be determined by the taking of food. In the advanced stage fever is nearly constant, but evening sweats and morning exacerbations remain characteristic of it to the end.

Notwithstanding the great and constantly-increasing emaciation, which may be ascribed to the loss of nutritive fluid by the suppuration or other discharge, the appetite and assimilative functions are comparatively little affected, at least in the less advanced stage of the disease. Sometimes, it is true, there are exceptions to this, but it is when the assimilative organs are directly involved, as in many of the cases of hectic fever falling under the notice of the physician. In the ordinary forms of hectic connected with surgical diseases, the appetite continues; the food is taken during the remissions with considerable relish. The tongue may be natural in appearance, or it may present a slight fur, with red edges; often it is preternaturally clean and glistening, as if covered with some fine membrane. It is rarely much loaded, and never permanently dry and rough, as in typhoid fever. The bowels are frequently constipated, as in other diseases implying protracted confinement to bed, but not unfrequently they are natural; or there may be, as just mentioned, diarrhœa.

But exemption of the nervous centers from participation in the general disorder is perhaps a more striking characteristic of hectic, as compared with inflammatory or typhoid fever, than almost any of those yet mentioned. Throughout the whole course of the affection the mind may remain perfectly clear; not uncommonly, indeed, the mental faculties seem to be possessed of uncommon vigor, even when the body is very debilitated. In the interval of the paroxysm the patient usually procures sound and refreshing sleep, and even when the fever has become constant, the harassing watchfulness of the typhoid fever is rare. Sleep may, it is true, be light and frequently broken, but it is obtained in sufficient quantity to preserve the cerebral functions in a state not differing far from health.

The duration of a hectic fever may be almost indefinitely protracted, especially when the intervals of the paroxysms are tolerably free from febrile excitement. When, however, the fever is constant, when sweating is excessive, and when there is profuse suppuration or other discharge, progress to a fatal termination may be rapid: emaciation proceeds to the last stage, the features assume a shrunk and withered aspect, the eyes are sunk in the orbits, all the bones are prominent; the flushing subsides into a pallid, leaden hue. Death is usually by pure exhaustion, the pulse and respiration ceasing very, very gradually, and the mind often remaining unclouded almost to the last.

(To be continued.)

EDITORIAL.

THE PROVINCE OF DENTISTRY.

"Oral surgery in America seems, if this work is to be taken as a faithful guide, to embrace every disease of the face and neck; and the 'oral surgeon' must be prepared not merely to stop and extract teeth and remedy faulty dentition, but to operate for cleft palate, hare-lip, and tumors of the jaw and neck. . . . We have not as yet advanced to that stage of development which necessitates the formation of the speciality of 'oral surgery,' and we hope we may long be spared the infliction."—*Review of Dr. Garretson's System of Oral Surgery (Lancet).*

"The chief object of the author seems to have been to ascertain how big a book he could possibly make on the somewhat limited subject which he has chosen for discussion."—*Review of Dr. Garretson's System of Oral Surgery (American Journal of Medical Sciences).*

"Had it been issued in two volumes, instead of one,—one upon 'Dentistry' and the other upon the 'Medical and Surgical Treatment of the Mouth and Associate Parts,'—its present bulkiness would have been obviated, and the dentist then could have gotten his part and the physician his, without either being compelled to get both."—*Review of Dr. Garretson's System of Oral Surgery (Medical Archives).*

"If the sole object of dental education is to teach men how to extract and fill teeth, then such a volume as the one in question* is indeed out of place; but we are glad to recognize the fact that dentistry of the present day has risen above the plane which makes it simply an art, and that it has become a science. It must keep pace with medicine, recognizing the facts in pathology which are now universally and unreservedly accepted, or it will cease to maintain the respect we have learned to entertain for it."—*Boston Medical and Surgical Journal.*

THE extracts quoted above are samples of many which we have seen, and which demonstrate that the province of dentistry is an unsettled question in the minds of medical writers.

In the estimation of the writer in the *Lancet* the function of the dentist is "merely to stop and extract teeth and remedy faulty dentition." According to the *American Journal*, dentistry is a "somewhat limited subject," while the *Archives* suggests a division of the topics treated in a work on oral surgery, so that the "dentist could get his part and the physician his, without either being compelled to get both."

In contrast to these opinions, the *Boston Journal* asserts that to maintain the respect which it has learned to feel for the profession, dentistry "must keep pace with medicine."

In a recent number of the DENTAL COSMOS we published a list of questions pertaining to the examination of a licentiate in dentistry by the Royal College of Surgeons, and congratulated our readers on the status which the ability to pass such an examination must insure to the profession in England, because a guarantee of that capability which is alone the recommendation of the true professional man. It sounds strange, therefore, to hear the London *Lancet* speaking of the province of the dentist being limited to stopping and extracting teeth, and hoping to be spared the infliction of a specialty devoted to oral surgery. We were indeed inclined to wonder, when reading the questions propounded by the dental examining board of the Royal College, if dentistry in England had not by some sudden stride outstripped us here; but if the English practitioners have not attained to a higher professional esteem than is indicated in the criticisms of the *Lancet*, we may still invite English students to avail themselves of an American education. But what shall be said of such men as Tomes, and others who might be named, whose talents and acquirements we had supposed commanded the respect of the scientific world? Can the *Lancet* be ignorant of these men, or of the reputation which they have earned?

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* Wedl's Pathology of the Teeth.

The question is not so much, however, what are the qualifications of the majority of those now practising dentistry, but what is its legitimate province, and what are the requirements for its intelligent practice? Granting that the "somewhat limited" function of the dentist is merely "to stop and extract teeth and to remedy faulty dentition," how can even these requirements be intelligently met, except through an appreciation of principles which underlie equally the practice of medicine and of dentistry? To be competent to treat abnormal conditions of the teeth as of any other organ or part of the economy, there is required a knowledge of their anatomical structure, their relations to surrounding parts, their nervous, arterial, and venous connections, and, as well, a recognition of pathological conditions, of the indications for treatment, and of the philosophy of therapeutics.

No subject can be truly said to be limited, the practice of which demands a knowledge of physiology and pathology. And we venture to say there is no branch of medicine or surgery so little comprehended by the general practitioner as that which legitimately belongs to the province of the scientific dentist.

It is time that the illiberal spirit which has too often been manifested by the medical profession towards the practitioners of dentistry should be laid aside. Its claim to position as a specialty of medicine is valid or it is merely a mechanic art. If an art alone, of what significance are its colleges and degrees? if truly a branch of the healing art, what justification is there in calling it a "limited subject"?

The eye, strictly speaking, is a limited subject, and the area occupied by the ear is not by any means large, but no one will assert that the knowledge or skill essential to the best treatment, when diseased, of either of these organs, is less than is required by the general practitioner. On the contrary, the advice of the specialist is sought by no class with greater eagerness, when in their own persons or in their families the need of treatment in these directions is recognized.

There are those who love to depreciate the skill of the uterine specialist, and to profess greater faith in a good midwife; but in threatening complications their opinions undergo a wonderful transformation, and the specialist receives the recognition to which his peculiar training entitles him.

It is needless to multiply examples. The necessities of the case demand special training to secure the highest results in practice. Dentists have established colleges and conferred degrees which it is a pity and a shame should have been accepted, if there were nothing to support the assumption, except the mechanical ability "to stop and to extract teeth."

If the intention of the colleges and the ambition of the students have no higher aim, the sooner the colleges are abolished the better; but if they are "keeping pace with medicine," they are entitled to the same honor as other specialists.

So far from hoping to be "spared the infliction" of a specialty of oral surgery, we believe such a division of practice as the name indicates to be the legitimate province of dentistry, and rejoice in the assurance that the men most capable of honorably acquitting themselves as oral surgeons are to be found among our American dentists.

THE ANNUAL GATHERINGS.

The Southern Dental Association will meet at Baltimore on the last Tuesday in July (29th), 1873.

The American Dental Association will meet at Put-in-Bay the first Tuesday in August (5th), 1873.

The American Dental Convention will meet at Saratoga Springs on the second Tuesday of August (12th), 1873.

BIBLIOGRAPHICAL.

A Manual of Dental Mechanics. By Oakley Coles, Licentiate in Dental Surgery of the Royal College of Surgeons, Dental Surgeon to the Hospital for Diseases of the Throat. With 140 Illustrations. Philadelphia: Lindsay & Blakiston. 1873.

No reader of dental journals can have failed to notice how very small a proportion even of the communications which are of a practical character have any reference to the work of the dental laboratory. There seems, indeed, danger that dental mechanics, through which dentistry first attained position and reputation as a calling, will degenerate rather than advance. The ambition to save the natural organs and restore them to usefulness, the disposition to consider the work of the office as more professional than that of the workshop, and perhaps the better remuneration of the former, have all contributed to a neglect of the mechanical department of the profession. To such an extent has this reached, that it is not uncommon to hear practitioners who have attained an enviable reputation in the operations of the office *boast* of their ignorance of the details of the laboratory.

Dentistry is, however, an art as well as a science; but all of the art is not in the laboratory, and all of the science is not in the office. To construct a substitute for lost organs on scientific principles is not less worthy the ambition of the student than are the more delicate manipulations at the chair. With these convictions, we are always glad to receive contributions illustrating any problem in the mechanics of the profession. With this feeling, we hailed the announcement of a forthcoming manual by so distinguished a dental mechanician as the author of the work before us.

In the preface the author tells us that the work is intended for the student rather than the practitioner; modestly disclaims originality, and professes to exclude all matters of doubtful value or merely theoretical interest, and to give information of a purely practical nature upon all matters relating to dental mechanics, devoting the most space to the questions of the greatest interest, and passing over minor details with but brief notice.

The subjects discussed are arranged in twelve sections, treating of the preparation of the mouth for artificial teeth, of taking impressions, of the various modes of applying heat employed in the dental laboratory, of casting in plaster of Paris and metal, of the precious metals used in dentistry, of making gold plates for partial and entire dentures, of the various forms of porcelain used in mechanical dentistry, of pivot teeth, of choosing and adjusting mineral teeth, of the vulcanite base, of the celluloid base, of the treatment of deformities of the mouth. An apppendix treats of making gold-plate, of solders, fusible metals, spiral springs, and a variety of miscellaneous matters.

The promise of the preface is not, we think, redeemed in one respect, too much attention having been bestowed upon things of doubtful value and theoretical interest, and too little upon essentials. We notice also a want of definiteness in much of the teaching, which may be the source of misunderstanding by the student. For instance, Sec. I., devoted to the preparation of the mouth for artificial teeth, directs that roots which give no pain on sharp percussion, and have no indication of inflammation about the adjacent gum, may be cut down level with the gum and allowed to remain. No distinction is made in regard to the retention of the roots of different classes of teeth, although there is evidently a wide difference in this respect between the roots of the oral teeth and those of the bicuspids and molars So, in regard to the question, how soon after extraction artificial teeth may be inserted, our author asserts as the result of his experience that twenty-four hours is enough, and that cases fitted in immediately after extraction, even of ten or twenty teeth, so fulfill every requirement of a permanent set that no further change is necessary.

We cannot conceive that a plate, adjusted to the gum in twenty-four hours after the extraction of ten or twelve roots, should fit satisfactorily after the lapse of eighteen months or two years. Granting that the plate may still be retained by atmospheric pressure against the roof of the mouth, the absorption of the processes on the labial and buccal borders must result in imperfect adaptation of the plate. The mouth too will almost of necessity lose its contour, and require to be restored to its original fulness by plate or artificial gums.

We fear the directions for taking impressions of the mouth in plaster are not sufficiently explicit, and would, if literally followed, result in an imperfect representation of the arch.

The section on the precious metals used in dentistry deals almost exclusively in matters that do not practically concern mechanical dentistry of to-day, omitting much which is essential to a proper knowledge of the subject. American dentists generally place a higher value on silver than our author is disposed to accord it; but there is room here for difference of opinion. The discussion of cavity plates, their advantages and disadvantages, the conditions in which they can be used with benefit, the method of preparing a natural root for the reception of an artificial crown, the liability to peridental trouble and alveolar abscess, and the means of prevention, are topics imperfectly treated. He says pulps must not be destroyed with arsenic when the root is to be prepared for pivoting, but does not say why; and we fail to see why any special distinction should be made on this account.

In the chapter on choosing and adjusting mineral teeth, Mr. Coles speaks of a display of "sound judgment and artistic feeling" being necessary in the selection of artificial teeth, but gives no directions to enable the learner to select and arrange them.

The chapter on vulcanite is perhaps the best in the book; but we observe the omission of important matters, such as a description of the various methods of increasing the weight of lower plates, and of strengthening plates by means of a perforated gold plate.

The section on celluloid is reasonably full and comprehensive.

A want of care is manifest in numerous instances, such as the use of the term "model" alike for plaster cast and metal die. Some inelegancies are also introduced, such as "stump" and "fang" for root, and "cooking" for vulcanizing.

The illustrations are numerous; but some of them are not true to the subject, and many, more recent and better, are omitted. The book is not in our judgment so well adapted to the student as it might be, because of the absence of detail in important matters, and also because of failure frequently to base direction on principle. It is, however, a condensed and comprehensive *résumé* of mechanical dentistry, and we would rejoice to believe that one in five of the profession in England or America could "stand an examination" based on the matter therein set forth.

CORRESPONDENCE.

London, March 25th, 1873.

Mr. Fletcher's new white enamel, which he puts forward with the fullest confidence that it will eventually supersede every material at present in use, is, as I predicted it would be, now being systematically tested by the profession here. A committee of the Odontological Society was appointed at a recent meeting to report upon the filling, and a preliminary statement by Mr. Coleman, a member of the committee, has just been published in the society's Transactions. This statement deals principally with the specific gravity of the various oxychloride fillings, and goes to show that although Mr. Fletcher's filling possesses more valuable qualities than any other similar preparation, it is hardly fitted "to replace every other material at present in use for filling teeth." I have ascertained from Mr. Fletcher that his cement consists almost entirely of oxide of zinc, the only admixture being a small quantity of Lancashire marl. The peculiarity of the filling consists in the absolute chemical purity of the oxide, which is produced by Mr. Fletcher by an elaborate process. The fluid used is a solution of chloride of zinc. The compound undoubtedly resists the action of acids in a remarkable manner, and Mr. Fletcher tells me that it is but one of a series of similar products which can be formed by analogous agents. Mr. Fletcher's work is at least based upon scientific reasoning, if his promises have not yet been entirely fulfilled. The *Monthly Review* has a special commissioner at work on this subject,—the eminent chemist, Professor R. V. Tuson,—who is preparing a report upon the physical and chemical properties of the enamel, especially experimenting with it under conditions similar to those under which a filling is placed in the mouth.

The Dental Hospital of London is about to be removed from Soho Square to some better position, as it has now outgrown the accommodation which the old building affords.

The Odontological Society's present session does not promise well. The president is by no means well fitted for his position, and the other officers are perhaps the least efficient that the society has hitherto possessed. This arises from the constitution of the society, which allows the council to nominate the new officers each year, subject to the election of the general body of members. Of course when the council carry out their function with wisdom and impartiality, all goes well. This time they certainly have not displayed wisdom, to say the least, and the members will keep a sharp look-out to prevent a similar mistake at the next election. Mr. Sercombe, who I anticipated was to be elected president for this session, was not nominated for the post.

Among literary matters, I may mention that an article by Mr. Jas.

Salter, M.B., F.R.S., on "Suppuration and Sphacelus of the Tooth-pulp," appears in the new volume of Guy's Hospital Reports. A beautifully illustrated work is just out on *Diseases of the Tongue*, by Mr. Fairlie Clarke, M.A., M.B. Oxon. Mr. J. S. Turner will contribute papers to the forthcoming numbers of the *Monthly Review*. These papers will have for their subject American practitioners and dental schools. Mr. Turner, as you are aware, has just returned from a tour in the States.

Burring engines are coming very generally into use here. At a recent meeting of the Odontological Society, a discussion upon them took place. Morrison's invention received much praise. With these engines and with the rubber dam, for both of which we have to thank Americans, it is agreed there can now be no excuse for the performance of slovenly plugging operations.

The discussion of the cause of death following the inhalation of nitrous oxide has at length been closed. The conclusion arrived at is that, in all probability, the fatal result was brought about not by the direct action of the gas, but by asphyxia, arising from the entrance into the glottis of a splinter missing from the wooden gag, which was used to keep the mouth open, and which was probably broken during the operation. Other plausible theories have, however, been suggested, and much indignation has been expressed that the coroner, who has the power, did not order a *post-mortem* examination, so that the real cause of death might have been ascertained. One good effect, at least, has been achieved by this death. It has greatly diminished the number of administrators of the gas, of the charlatan species, who had previously been recklessly using it in spite of all the warnings of professional authorities.

"We regret that Mr. Tomes should have been misrepresented in this country, and so far as we have been the cause, we gladly make the *amende honorable*." Such is the kind of phraseology by which your cotemporary, the *Missouri Dental Journal*, prefaces a letter in the February number from Mr. Charles S. Tomes. From that sentence, and from other expressions, those unacquainted with the actual facts might suppose that I had grossly misconstrued Mr. Tomes's paper on amalgams in my letter in which I referred to that subject; but if your readers will kindly turn to my letter, they will see that I did not quote Mr. Tomes's exact words, and that I merely stated in my own terms that Mr. Tomes's experiments proved that Sullivan's copper amalgam must be highly valued as a cement of this kind, by reason of its small comparative shrinkage while setting. Your cotemporary has probably no high opinion of English dentistry, or he could not have construed my language into any but its obvious meaning, and he would have surely not thought it possible for Mr. Tomes to have preferred

Sullivan's cement to gold; or to have suggested its employment in any but the exceptional cases to which it is specially suited. That your cotemporary really holds English dentistry in no high estimation is, however, evident from the way in which he alludes to the subject at page 75 of the same number. I may perhaps be allowed to beg your cotemporary (especially as he is sensitive on the point of "misrepresentation") to make some further inquiry with regard to English dentistry before venturing upon gratuitous sneers, having no better justification than an isolated sentence in your correspondent's letter or a single expression in a contribution to the *Monthly Review of Dental Surgery*.

PERISCOPE.

Professional Literature.—In looking over the past and present of dentistry, it is easy to see why we still lack able works on several important special subjects: there has not been time for their production.

It is only during recent years that we have become awakened to the breadth and complexity of the problems that present themselves to the dentist for solution; it is only recently that we have realized the difficulties that must be encountered in solving these problems.

Inquiries relating to the morphology, physiology, and pathology of dentine, its molecular defects, its modifications in disease, and under different remedial influences; the questions of form, development, and life-endowment, that arise from the study of both dentine and enamel; many chemico-vital problems, involving study in dietetics, and the wonderful influences that are impressed upon the delicate dental germs during gestation, are some of the unworked or but partially wrought territories of dental investigation. In these and other unnamed subjects of inquiry are mines of rich materials for the man of science, and many an unclaimed, though fertile spot, on which the accurate observer and close thinker may plant himself, with test-tube and microscope, to make for himself a secure place in the history of this new specialty of medicine.

Many subjects have yet to be made clear: the influence of diet on the teeth; the facts of histology; the laws of restoring lost features; the assimilation of the phosphates, and a multitude of topics in dental medicine.

We have as yet no work on diagnosis, none adequate on dental therapeutics, and a number of special departments in dental pathology already await their accurate observer and recorder.—*Editorial in Dental Register.*

Dental Pepsin.—For about two months I have been using this preparation. I would recommend all to try it, for it is only by experiment that we can decide upon its value. The February number of this journal contained two articles upon pepsin, to which I would refer the reader, if he has not already seen them. I have used this substance for digesting or dissolving all the dead pulp in a tooth. The *buccal* roots often presenting considerable difficulty in the way of removal of their dead soft tissues, this pepsin may prove valuable in removing their contents. When the pulp has been but partly destroyed by arsenic, I have used the pepsin to dissolve the dead portion, and have afterwards plugged over the remaining living portion. The portion alive may be capped over with oxychlo. zinc. I mix the latter thick, and with it plaster over a small bit of gold foil in pellet form, carrying the latter to a point as near the living pulp as I can without pain or injury to the nervous tissue: then more oxychlo. until enough is placed to withstand mallet-force when gold is condensed on its surface. Pepsin may be left in the tooth two days, confined by a plug of *wax* and cotton. Sandarac varnish, or anything containing alcohol, *must not* be used as a retaining plug, for the alcohol will destroy or impair the action of the pepsin. *Wax* is *best* for the plug.

So far the results have been satisfactory to myself, and I shall continue to use the pepsin in every case of pulp death, until I have some unfavorable cases. It hardly seems necessary to say that creasote should not be used in connection with pepsin, but I am so afraid that some inexperienced young dentist will do something of the kind, that I think it best to say that nothing whatever must be used in the tooth but water, aside from pepsin, until you are *through* with the latter. After using arsenic and creasote, syringe the cavity well with warm water before using the pepsin. Sop the pulp cavity well with pepsin, and shut it in there for two days.—*Dr. Henry S. Chase, in Missouri Dental Journal.*

Trismus from a Compound Filling.—Five or six weeks since a dental practitioner was consulted by a lady, perhaps eighteen years of age. She had a cavity in her superior anterior bicuspid, involving portions of the labial anterior and masticating surfaces,—the greatest portion, however, being on the labial surface (after properly excavating); the pulp was not exposed, there being a thin septum of dentine between it and the proposed filling. The lady stated she was not able to pay for a gold filling, and yet she wished it to have the appearance of gold; she was then informed that a tin filling could be inserted, to occupy, perhaps, three-fourths of the cavity, and the remainder of the cavity filled with gold. She readily consented to this pleasing prospect of securing the appearance of a large gold filling, little thinking or knowing of the result about to follow such an injudicious operation. The tin filling was placed and the gold filling over it, and the lady left the office highly pleased with the operation.

She soon afterwards felt a slight stiffness in the posterior part of her neck, which in a short time increased, and ultimately rendered the motion of her head difficult and painful, and there was experienced an uneasy sensation at the root of the tongue, which increased and caused great difficulty in mastication and deglutition; the eyes were apparently somewhat distorted, and the nostrils dilated, tonic spasm of the temporal and masseter muscles ensued, and the muscles in immediate connection with the jaws became painful; the stiffness of the jaws increased to such an extent as to produce complete occlusion.

There was, undoubtedly, a galvanic action excited between the two metals, the conducting facility of the metal irritating the nerve periphery in the pulp, and the irritation, being referred to the appropriate center, was thence reflected to the muscles of mastication.

Her system may, perhaps, have been in such a condition as to predispose to an attack of trismus upon the least exciting cause, and she may have been exposed to extreme cold or dampness, and thus the filling, which, in most individuals would, perhaps, result in nothing more than irritation, in her case produced trismus.

Fortunately, the filling was in a position where it could be removed, and this was promptly done upon her visiting the dentist several days subsequent to the insertion of the filling. After its removal, an application of the battery was resorted to, which afforded some considerable relief; the jaws could then be slightly separated. Tinct. lobeliæ was also administered, though in what doses I was unable to ascertain. In the course of a few days the lady pronounced herself fully recovered. After all irritation had subsided, a filling of some non-conducting substance was introduced, over which gold was placed.—*Dr. F. D. Clum, in Dental Times.*

TREATMENT OF EXPOSED PULPS.—The subject presented is one of the most difficult we have to treat. The capping of a pulp, or its extermination, is a small operation in surgery, but a great one in the saving of a tooth. It requires as much skill to doctor a mouse as to doctor an elephant. So sometimes as much skill will be necessary to save a pulp as to save a limb. Individual cases alone are of no value. But an accumulation of individual cases leads to the adoption of a theory. It is not possible to save all pulps alive, but we may, perhaps, adopt a method of saving the pulps in the teeth of healthy persons. When pulps are nearly exposed, the partially decomposed dentine may recover its vitality; the salts of lime may be again deposited, and thus the pulp be preserved. When the pulp is in a state of suppuration, what shall we do? We must consider the condition of the patient. Two persons may be wounded, the one being healthy the other not. Amputation may be performed in each case; the one recovers, the other dies. The same is true of the pulp. When the conditions are different, the results will not be the same. It is almost impossible to get a healthy condition, unless the pulp should be capped for some time. Something not irritating must be placed over it which it will tolerate. Os-artificiel isa good antiseptic, and in that measure preserves the pulp from spontaneous decomposition. It coagulates the albumen. If the pulp should be coated with creasote, carbolic acid or thymol, this coagulum may be formed sufficiently deep to leave healthy tissue below. If nothing but creasote is placed upon the pulp, it will, in time, run into decomposition. But if os-artificiel should be placed over it, it protects the coagulum for a long time, and in this manner protects the pulp. One of the great dangers of external wounds is in their exposure to the atmosphere. When exposed even for a short time, the germs of infusoria find a lodgment and produce suppuration. I do not say that it is necessary to be exposed to the air to produce suppuration, but exposure would certainly hasten it. In putrefaction, animal and vegetable organisms invariably appear. One of the most destructive agents to these organic bodies is creasote or carbolic acid; while in "grain and seeds it is shown that carbolic acid retards growth and development only while it is itself present. There is not an actual death of the germ, but its vitality is held in abeyance." It has also been shown that animal tissue which has been soaked in a dilute solution of carbolic acid may return to a normal condition. In the treatment of the pulp after it has been exposed, the course I would recommend is, to apply dilute carbolic acid, say one part in twenty-five of water (water will not dissolve more than one-twentieth of its bulk of the acid); if pure carbolic acid in its full strength be applied, the vitality of at least a part of the pulp would be destroyed, but the diluted acid would only destroy the germs of the infusoria and suspend the vitality of a part of the pulp, while the other part might be in its normal state; but if the pulp is left in this condition, the carbolic acid will be absorbed, and the part that has been diseased with such an irritant to the rest as to produce inflammation. To prevent this, I recommend that a capping of oxychloride of zinc be used, but this should not come in actual contact with the pulp. It should first be covered with a piece of parchment or some similar substance that had been wet with carbolic acid. The chloride of zinc is one of the best antiseptics, and it would prevent the part of the pulp that had been acted on by carbolic acid from running into decomposition when the acid has been removed.

The pulp is not changed into dentine, but only carries to the outside the fluids which form the dentine; first, by the formation of cells, which afterwards are changed into dentine. Dentine is not a deposit, but it grows as other tissues do. There is first a soft tissue, and then calcareous salts are deposited in the cells of this tissue.

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According to Dr. Barker, it is possible for the pulp to become healthy after exposure. How far does this possibility extend? If saved in certain conditions, how far do these conditions extend? There is a lateral circulation by anastomosis, and one portion of the pulp may be healthy and the other diseased. Nature tolerates a certain amount of effusion, and when creasote is applied to the pulp a tissue is formed which is not entirely without vitality, and which may after a time become organized again; seeds have been preserved alive for hundreds of years; teeth have been transplanted, and yet their vitality has been retained; some insects and plants may be dried, and kept for an indefinite time, and they will revive when moisture is again applied to them. How far may this be carried? There is a deposit of cells upon the outside of the living mass of the pulp, and these cells grow until the part is bridged over, and the space filled up by their growth extending from point to point of the tooth, as the pulp recedes.—*Dr. Buckingham, in Proceedings Association Alumni Pennsylvania College Dental Surgery, in Dental Times.*

Cases in Practice.—Mr. Kealing read the following communication: Charles Holmes, aged twenty, footman, consulted me in October, 1872, giving me the following history of his case. In June, 1871, his face on the right side swelled to a great size with much pain; the family surgeon lanced the cheek, and ever since that time there has been a constant discharge of pus from the place. Getting worse he became an out-patient of one of the large hospitals of London, where he was treated for several months for scrofula: he was subsequently seen by several other medical men and homœopaths, who all treated him for scrofula without any perceptible advantage, for more than two years and three months, till he came to me. On examination, I discovered that the remaining roots of the first upper right molar were in a state of necrosis; these being removed, I then passed a silver probe through the alveolar crypt of the palatine into the antrum and to the wound on the cheek. All pain ceased from that day. In less than a fortnight the wound healed, and the face has been improving in appearance ever since. The patient was introduced by Mr. Kealing, and was examined by the members present.

The chairman said he had himself met with a similar case which had been under treatment for two years. He traced the mischief to an undeveloped lower wisdom tooth, and after having removed it the patient was quite well in a fortnight.

Mr. Kealing described a case of disease of the inferior maxilla which he had successfully treated. The jaw was rigidly locked for three weeks, and very great mechanical force was required to separate the teeth sufficiently to enable him to use a very sharp-pointed explorer, to ascertain the cause of the mischief. There were three openings very near the condyle of the jaw outside the face, which had been discharging pus for a very long time. He discovered the dead root of a wisdom tooth on the right side, and succeeded in extracting it. In another case where the root of a bicuspid on the left side was somewhat in the shape of a Wellington boot with the toe pointing towards the condyle of the jaw, he deliberately fractured the alveolus in order to extract it, but afterwards pressing the fractured portions together he secured them in position, prescribed the *acidi carbolici* glycerin in the proportion of one ounce to five ounces of water, and a perfect cure was accomplished within a fortnight.—*Proceedings of Odontological Society, in British Journal of Dental Science.*

PATHOLOGY OF ANÆSTHETICS.—For the elucidation of our subject, a short review of these various modes of death will not be amiss just now.

It is quite conceivable for example that in sudden death from chloroform, real *death of the blood* may have occurred. The alteration of its character may have gone so far that its original constitution could not recover. The corpuscles may have had their vitality destroyed instead of being impaired. The power to absorb oxygen may have not only been suspended, but totally abrogated. The stream of life thus poisoned at its source could carry but death through all its devious course.

Death by the head, as from coma, due to the direct action of chloroform, is indeed very rare. The few cases recorded were all connected with diseased kidneys, and were therefore evidently predisposed to that mode of death by the poisoned state of the circulating fluid.

Death through the lungs, inappropriately termed asphyxia, but more properly speaking apnœa or suffocation, occurs from any cause which may interfere with the respiratory movements, such as strangulation, the lodgment of foreign substances in the larynx or trachea; or the tongue, like other voluntary muscles of the body, becoming paralyzed after the patient has been fully anæsthetized, falls back in the throat, as sometimes happens under anæsthesia for dental purposes, and thus dies from the prevention of a free ingress of air. It is quite certain also that the action of this agent may cause paralysis of the muscles of respiration in the same manner as when the spinal cord is diseased or has been injured above the origin of the phrenic or the intercostal nerves. In other cases the lungs may be so gorged with blood that the circulation is arrested in them, and literally causes death from *apnœa;* or the muscles of respiration may, from spasmodic action, fail to contract, and the patient dies from the suspension of this vital function. The agent, on the other hand, may so overwhelm the great nervous centers as to radiate through the body by universal paralysis.

The most common mode of death, however, occurs from *cardiac syncope*, a condition much favored in detail anæsthesia, in consequence of the position of the patient when breathing the narcotic vapor, by being seated in an operating chair in nearly a perpendicular posture; consequently, when anæsthesia is carried so far as to enfeeble the action of the heart, the subject readily faints, and then syncope places him in the worst possible condition, owing to the depressed state of the nervous system, for reaction. Thus it sometimes happens that no reaction takes place, and the patient almost immediately expires. This is particularly the case with chloroform. Another great danger with the agent in dental surgery arises from the fact that in most cases super-anæsthesia becomes necessary, by requiring the effect to be carried far enough to produce complete relaxation of the muscles of the jaws; or what is more probable, to totally overwhelm consciousness, so as to overcome that instinctive resistance caused by the dread of the operation previously existing in the mind, and which seems to linger even after volition is suspended. Death may occur from *paralysis* of the heart, the blood being loaded with a foreign vapor, as well as with the products of interstitial decay, rendering it no longer capable of exciting those muscular contractions which can only be brought about by the stimulus of healthy blood; hence, the great force-pump flags, fails, stops—and with it all the wheels of life stand still. A fatal result may occur from *spasm* of the heart causing a sudden arrest of the circulation—the organ, having emptied itself, remains firmly closed, refusing again to expand. This mode of death from anæsthesia is quite rare however.

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Although in nitrous oxide, in its pure state, be it understood, we have a far less dangerous agent than ether or chloroform, nevertheless, from the power which it has of producing great waste of the vital forces or of modifying the conditions of the fluids of the body, it may and does occasion not only dangerous symptoms, but even death. It is supposed to produce its anæsthetic effect by preventing the oxygenation of the nervous centers, and, although containing a large quantity of oxygen, it does not when respired part with any of it in its transit through the system, and is therefore exhaled in the same form in which it is taken. Its absorption into the blood has been shown by Dr. Hermann to be very great—one hundred parts of the blood at the natural temperature of the human body being capable of absorbing sixty volumes of this gas; and yet, as has been by him observed through the spectroscope, without entering into combination with or producing any change in this fluid, or suffering any itself, but merely exists suspended in the plasma of the blood until eliminated from the system. It is, therefore, perfectly obvious that nitrous oxide, in not parting with its oxygen, does not oxygenate the blood, although in not yielding oxygen still oxidation is not entirely arrested, inasmuch as a portion of the free oxygen in the blood continues to be acted upon, and the product of that oxidation, carbonic acid, finds an exit at each expiration. But here arises a serious objection to the employment of this gas as commonly administered, by breathing in and out from the same rubber-bag, by which act the patient is made to re-inhale the poisonous exhalations from his own lungs.

Nitrous oxide is contra-indicated as an anæsthetic in all cases of seriously diseased hearts, either functional or organic; in active congestions or inflammations of the brain, lungs, kidneys, or any organic or functional derangement of the medulla spinalis. Especially in the latter, the organic functions, breathing for instance, depending as they do upon the integrity of this organ, the patient may be lulled into the sleep of death or carried off in convulsions. The greatest caution should be observed not to exhibit it in general plethoric conditions of the system, or where a great tendency to cerebral hyperæmia exists. The principal danger from nitrous oxide gas, therefore, consists in its adding a foreign element to the blood which interferes with its proper function, as shown by the great lividity almost always present, and in its stimulating action upon the brain and nervous system, and an extreme pressure it causes upon the arterial system, as presented by spasmodic symptoms in certain stages of anæsthesia. Hence, its administration may develop latent tendencies toward inflammation or congestion of the brain or lungs, or may even produce the rupture of arteries in other portions of the body, should they be in a diseased condition. It is therefore an error to suppose that it can be given in all *sorts and stages of disease*, as people are made to believe through the laudations of its advocates.—*Abstract of Lecture by Dr. Andrew J. McLean.*

THE ADMINISTRATION OF ANÆSTHETICS.—One rule laid down most stringently by the great master of anæsthetics, and one of the most important, is that which is most studiously avoided, especially in hospital practice. I refer to Simpson's rule that absolute silence should be maintained in the room during the administration of an anæsthetic. There should be no talking, no walking, no clanging of doors and instruments, until a complete unconsciousness has been arrived at for the patient. Not a sound should be heard in the room, save the gently repeated request of the administrator to the patient to keep the eyes shut and take long breaths. Instead of this, how often do we hear garrulous bystanders, loquacious operators, or officious nurses, suggesting to the patient, in the last moments of his consciousness, ideas which often run into action and produce the excitement and struggling for which the innocent anæsthetic is most wrongfully blamed. No one can appreciate the importance of absolute silence on the part of the bystanders during the administration of an anæsthetic, unless he has suffered personally from their thoughtlessness, as I have, while being put under its influence.—*Mr. Lawson Tait, in British Med. Journal.*

ANÆSTHETICS AND INHALERS.—Dr. Skinner, of Liverpool, writes as follows: If there be one evil more crying, more disgusting than another, in the practice of inducing anæsthesia, it is the use of inhalers. So long as we are only experimenting upon the lower animals, there can be no reasonable objection to their use; but when we come to administer chloroform, ether, or any such agent, to ourselves, I for one throw out a decided protest against being required to inhale through any instrument which has been used for a similar purpose by another man, woman, or child. There is not one inhaler, my own excepted, where every patient is not made to breathe through the same mouthpiece, tube, and chamber. There is not one mouthpiece which is not made to fit every person, bearded or not bearded. Sweet seventeen is made to follow a bearded devotee to Bacchus, saturated with the smoke of cigars and the exhalations of cognac; or another whose nasal and pulmonary mucous membrane, leave alone the cutaneous surroundings of the mouth and nares, may be exhalant of all odors but those of purity and innocence, and when looked into may be found sensible to sight as well as smell. I repeat, the same mouthpiece and apparatus are applied indiscriminately to all, and without anything being interposed. In consequence, the mouthpiece in time becomes loaded with grease, and filthy enough to upset any one's digestion and sleep for a considerable time to come. The reasons why the filthiness of the practice has hitherto been overlooked are, that the patients are in general so absorbed in the newness of the step they are about to undergo, or so dread the being anæsthetized, or the inhaler otherwise is made so externally inviting in appearance, especially if new, that it is never detected or complained of. Besides, the smell of the anæsthetic so soon kills the smell of the inhaler, and the sensitivity of the party inhaling, that it is lost sight of.

Ignorance of the disgusting nature of the practice does not in the least rob it of its repulsiveness and effects. Only fancy inhaling through the same apparatus just used by a patient suffering from ozæna, specific or non-specific, or from some one of the countless chronic, constitutional, and contagious(?) diseased conditions of the oral, naso-pharyngeal, and pulmonary mucous membranes. We surely do not require to be informed, at the present day, that we exhale something more than carbonic acid and water; but it would appear that the inventors of the endless number of inhalers for the purpose of administering anæsthetics really believe that we exhale nothing more.

Speak of refinement! we turn up our noses if we have not a clean table-napkin every day, if our knife, fork, spoon, and plate, be not cleaned or changed after every dish, or course, at dinner; if we have not separate finger-glasses and the like; but when we come to inhalation,—although we all have, thank heaven, been provided with separate lungs and air-passages,—after twenty-five years' experience of medication by inhalation, we remain the merest barbarians, every one breathing after his neighbor, and through the same instrument.—*Dr. Skinner, in British Medical Journal.*

Case of Supposed Scurvy in a Nursing Child.—In September I was called to see a nursing child, aged nine months, of healthy parents. The child exhibited purple spots over the posterior aspect of both arms and legs. One spot on the left thigh was as large as the palm of my hand. The borders of the spots were yellow, as though the child had been beaten. Indeed, a homœopathic practitioner told the mother that the child had fallen, or had been burned, and that he could do nothing for it. The child's gums were spongy and bleeding. Beneath these spots, the tissues had an indurated feel. The mother inquired of me, "What is the matter with my child?" I asked her if she was in the habit of drinking large quantities of tea. "Yes, I drink tea at all the three meals and between meals, and in addition take a bowl at bedtime." This mother had evidently *tea-ed* her child almost to death. A change of diet was recommended, and in two weeks the child was well. —*H. W. H. Mathis, M.D., in Nashville Journal of Med. and Surgery.*

Neuralgia.*—After a chapter on "Painful Excitability of the Spinal Cord," considerable space is devoted to a consideration of Dr. Radcliffe's theory that pain depends essentially on a depressed state of the circulation, of anæmia instead of hyperæmia in the nervous centers; a theory fundamentally opposed to that of Dr. Chapman. The argument from the depressed state of the peripheral circulation is rejected on the ground that peripheral anæmia, so far from being an indication of a similar central state, may much more justly receive the opposite interpretation, as due to the over-action of the vaso-motor centers. Accepting Dr. Radcliffe's somewhat questionable assertion of the relation in time of pain and inflammatory phenomena, that pain rather precedes than accompanies inflammation, Dr. Chapman explains it in a different manner, assuming that the vaso-motor relaxation attending the inflammatory process is conditioned by the exhaustion of the sensory nerve-cells which have previously, while in painful activity, held the vessels constricted in reflex spasm. The painlessness of spinal myelitis, and of spinal meningitis apart from movement, is one of Dr. Radcliffe's arguments in support of the theory that hyperæmia is antagonistic to pain. On this point, as Dr. Chapman shows, the weight of authority is decidedly opposed to Dr. Radcliffe's facts. (We may remark that some, though certainly not all, of the discrepancy is to be accounted for by the degree of inflammatory change, mere congestive hyperæmia increasing, destructive inflammation annihilating pain.) The phenomena of "pain the result of tenderness," which Dr. Radcliffe is obliged to except from his explanation as contradictory to it, are urged with great force as being fatal to a view, which, if it holds good at all, should do so universally.

The predisposing and exciting causes of neuralgia furnish the subjects of the next two chapters, while the succeeding one is devoted to a consideration of Dr. Anstie's views on the pathology of the affection. To these Dr. Chapman's facts and theories are strongly opposed, and he devotes considerable space and great pains to a detailed consideration of Dr. Anstie's chief positions, that neuralgic phenomena are expressions of defective nutrition, involving lowered vitality of the nerve-centers affected, and commonly the result of atrophy of the posterior root and sensory center of the affected nerve. Dr. Chapman objects, and with justice, that in no case of true neuralgia has a *post-mortem* examination revealed such atrophy to exist, and he urges that the history of the symptoms and minute pathological anatomy of locomotor ataxy fail to establish the existence of any state of simple atrophy such as Dr. Anstie infers, but rather point to a primary hyperæmic condition with which the initial pains are connected. A similar objection is urged to the other evidence on which Dr. Anstie relies, viz., the pains of spinal paralysis, and the phenomena of shock, exhaustion, cold, etc., all of which Dr. Chapman believes are associated, not with defective nutrition in the center concerned, but with hyperæmia, and with increased, instead of lessened, energy.

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* "Neuralgia and Kindred Diseases of the Nervous System; their Nature, Causes, and Treatment: also a Series of Cases exemplifying the Principles and Practice of Neuro-Dynamic Medicine." By John Chapman, M.D., M.R.C.P., M.R.C.S. London: Churchill. 1873.

In the chapter on the treatment of neuralgia, the various drugs and methods which have been proposed for its cure by alleviation are passed in review, and the system which the author has introduced, and which he designates the "neuro-dynamic treatment," described at considerable length. The principles on which the method is based are the following (p. 284):

(1) The chief function of the sympathetic nervous system consists in regulating the diameters of the blood-vessels throughout the body. (2) When the sympathetic ganglia are in a state of maximum hyperæmia, the nervous influence from them stimulates the muscular coats of the arteries so excessively as to induce in them a state of tonic spasm which shuts off the blood altogether from a large proportion of the peripheral arteries. (3) When these ganglia are in a state of maximum anæmia, the nervous effluence to the arteries is so feeble that a condition resembling paralysis is induced, and the parts supplied become effused with blood to an extreme degree. (4) When the spinal cord is in a state of hyperæmia, cramps of the involuntary muscles of the alimentary tube, cramps or even convulsions of the voluntary muscles, and excess of glandular activity and of sensibility, are likely to ensue. (5) Every gland is under the influence of a positive-motor nerve distributed to the cells, and a negative-motor nerve distributed to the blood-vessels. (6) The tissue elements and vessels of every tissue in the body are under similar nerve control. (7) The sympathetic ganglia and spinal cord can be rendered hyperæmic or anæmic artificially, by means of heat in one case and cold in the other applied along the spine. (8) Cold along the spine will subdue cramps or excessive tension of both voluntary and involuntary muscles, will lessen sensibility, will lessen secretion, and while increasing, within certain limits, the general circulation and bodily heat, is capable by prolonged use of lessening textural nutrition. (9) Heat applied along the spine will in some cases induce cramps of both voluntary and involuntary muscles, will increase sensibility and secretion, and will lessen the general circulation and bodily heat.

The three last propositions are developed at length, and illustrated by a remarkable series of one hundred cases of neuralgia and other affections treated on the neuro-dynamic method. Some cases were treated by cold, others by heat, along the spine, according as the collateral phenomena presented evidences that the negative- or positive-motor nerves were acting in the greater excess. Besides various forms of superficial and visceral neuralgia, the cases embrace examples of hyperæsthesia, cerebro-spinal fever, cramps, epilepsy, fainting fits, tinnitus aurium, giddiness, sleeplessness, "tendencies to insanity," impairment of memory, of sight, of sensibility, partial paralysis, expectoration, vomiting, diarrhœa, constipation, various forms of perverted menstrual function, leucorrhœa, prolapse of the uterus, albuminuria, diabetes, all treated by this system with a degree of success which is certainly very remarkable. In several cases of neuralgia of long standing one or two applications seem to have afforded permanent relief. "Of thirty-six cases of headache, in thirty-five the symptom was completely cured." "Of eighteen cases of uterine neuralgia, in fourteen the neuralgia was thoroughly cured, and in the remaining four a remarkable improvement was effected." "Of twenty-four cases of leucorrhœa, in thirteen the discharge was stopped completely, and in the others greatly lessened." The records contain very few instances of failure.

As Dr. Chapman shows in one of his earlier chapters, the phenomena of pain, considered apart from any theory of its causation, lead almost irresistibly to the conclusion that it consists in excessive functional activity of the nerve structures. That many forms of pain may be removed or alleviated by the application of heat or cold to the spine, and that other phenomena, not in the current pathology associated directly with nervous influences, may be effected in a similar manner, the recorded facts, taking them as they stand (and even allowing for an occasional too hasty assumption of therapeutic influence), seem conclusively to prove. In many important points, too, they have been confirmed by the testimony of independent observers, and have received confirmation to which, for reasons not far to seek, no testimony has been borne. But that the excessive function of which neuralgia is the expression is the *result* of hyperæmia in the center, and that the "neurodynamic treatment" acts by diminishing that hyperæmia, are hypotheses which, however probable they may be, we think can hardly yet be considered as proved. We do not yet know how far perverted direction, instead of augmented degree, of nerve action, may lead to morbid phenomena, and, moreover, from theoretical considerations, it is not improbable that excessive action in a certain direction may exist without any necessary hyperæmia. Dr. Chapman would base his view of the pathology on the effect of the application of cold to the centers; but to render this a proof of their hyperæmic state, we submit that it should be shown that cold can produce the effects attributed to it in no other way than by its action on the vascular supply of the center. The nervous tissues stand so far apart from all other tissues of the body in their essential characters that an argument from analogy can have but a limited application to them. It may be that the cold and heat have such an influence direct or reflex on the elements of the nerve-center, apart from all action on the vessels, as would explain most of the phenomena Dr. Chapman records.

In conclusion, we would suggest to Dr. Chapman the value of some careful experiments on the effect of his method of treatment on sensation, motion, and secretion, in health; experiments which would be easily made, and might furnish some valuable physiological information as well as useful therapeutic data.—*"Bibliographical," in Med. Press and Circular.*

ODONTALGIA CURED BY QUININE.—Matilda W., aged seventeen, a domestic servant, was admitted on November 1st, 1872. For three months she had had very severe pain in the teeth. At first, those of the upper jaw were mostly affected. During the three weeks preceding her admission, the pain had been confined to the left half of the lower jaw. The pain always precluded all hope of sleep if it came on in the evening. The teeth were very defective in the upper jaw. On the right side all but the incisors were wanting; on the left the first bicuspid and first molar were absent. In the lower jaw, on the right half the first and second molar, and on the left half the second molar, were wanting. All that remained of the other teeth were simple stumps, much decayed and discolored. The general health of the patient had been pretty good; the various functions were well performed. She was ordered to take at once a draught containing twenty grains of sulphate of quinine, with dilute sulphuric acid, in an ounce of water. The draught produced cinchonism, with speedy and great relief to the pain, which in the course of thirty-six hours had entirely subsided. She remained as a patient for a fortnight, when she was discharged, having taken no other medicines, and having had no return of the pain.

Dr. Wade drew the attention of the students to the success of the treatment in this case, and stated that a sufficiently large dose of quinine will almost invariably cure odontalgia, even when the teeth are destroyed to so great an extent as they were in this case. Over odontalgia caused by inflammation, or abscess at the extremity of a fang, quinine exerts no influence. The dose required to remove the pain and produce cinchonism varies considerably from fifteen to thirty grains; and it is worth notice that, whereas a sufficiently large dose will cure the odontalgia, an insufficient one, although a large dose, will not alleviate the pain at all.—*Birmingham Hospital Reports, in British Med. Journal.*

ECLAMPSIA CAUSED BY URÆMIA.—Dr. Gajasy (*All. Wein. Med. Zeit.*, April 15th, 1873,) mentions the case of a child, aged eight months, brought up by a wet nurse, which, four days after weaning, began to exhibit the following symptoms: bending of the head to the left side, steadfastness of the eyes, and twitching of the corners of the mouth and hands. In three days constipation set in. These fits became better for some fourteen days, but then commenced with greater intensity than before; so that at last the fits were continuous. The breathing became more difficult, and cyanosis appeared, the eyes being lifeless and staring, and the thumbs turned in. The diagnosis was eclampsia, caused by a reflex irritation of the medulla oblongata from the peripheric nerves. Eclampsia from dentition difficulties are of the worst consequences of all forms of the disease, since after this form we may see paralysis and idiocy remain. The appearances pointed to uræmic poisoning, for the child cried out, ground its teeth, and moaned; the eyes were turned round about, and it moved its hands and feet continually about, and bloody foam exuded from the mouth, falling off to sleep on the cessation of the fits. Cold water compresses were ordered to the loins, lemonade for drink, and benzoic acid as a remedy. The parents were told to douche the head with cold water whenever an attack came on. The benzoic acid powder was given in doses of one grain every hour. As diet, the child took milk and yolks of eggs. This treatment soon succeeded in putting an end to the fits, and the child recovered and became fat and strong.—*Med. Press and Circular.*

MALIGNANT ULCERATION OF LOWER JAW.—Charles H. W., aged twenty-nine years, recommended to me by Dr. Homer Judd, dentist, of this city. Malignant ulceration of the gums of the teeth of the left side of the lower jaw, extending to the velum palati and down the larynx, destroying the left half of the epiglottis and left vocal cord, producing aphonia.

About three months ago he had a tooth extracted, because of obstinate ulceration of the gum surrounding it; but previous to its extraction it had become very loose. The alveolar process also was removed by the same molecular destruction that melted away the gum. The extraction of the tooth did not stop the disease, nor was it checked by any application made to it.

When the case came under my observation he had had all the molar teeth extracted. The alveolar processes had been destroyed to the depth of half an inch, leaving the bone covered with a granular fungus, the color of which was but slightly increased as compared with the surrounding mucous membrane. This bled upon the slightest touch. He was very positive that he had never had any opportunity to contract venereal disease. On close examination, it was found that the disease had commenced by attacking the peridentine of the tooth, at the upper margin of the gum, and had followed this down the entire length of the fang, thus loosening the tooth. After the destruction of the investing membrane of the tooth, the ulceration spread to the gum and the alveolar process, melting both down to the body of the maxillary.

On September 17th, 1869, the gum on the inside and outside of the left bicuspid was entirely separated from the teeth by the ulceration; and when this portion of the gum was pressed against the tooth a small quantity of fetid pus appeared. There was but little pain attending this destructive process. The loose gum could be cut without occasioning much pain. The contrast in this respect between the detached and other portions of the gums was quite marked. Two days previous, the patient said, the gums of this tooth were firm and sensitive as any portion of his mouth, and thought, judging from his past experience, that it would take about eight or nine days before the tooth began to become loose, and then three or four more before it would be forced inward by the pressure of his cheek against it. None of the teeth have been discolored in the least. The disease was spreading toward the throat, had destroyed the anterior pillar of the arch of the velum palati, and was attacking the remains of an indurated tonsil. He did not have much pain in performing the act of deglutition, but had a sense of "drawing" in the left ear during the performance of this act. Since ulceration had attacked the soft palate, he had regurgitation of his food, and especially of fluids, up into the pharyngo-nasal space. No great amount of inflammatory action was found in the air-passages, above or below the mouth. He had heretofore enjoyed usual good health. His appetite was good; bowels regular; slept well; pulse regular, eighty per minute, full and strong. Had lost a little in weight—about two or three pounds—within the last two or three weeks.

The local treatment consisted in the application, by spray, of about one ounce of the following solution, viz.: Liquefied carbolic acid, fʒij; glycerin, f℥ij; water, f℥vj;—the instrument being so constructed as to throw this fluid directly upon the diseased surfaces. This had the effect of removing all of the fetor, and relieving the ear symptoms during the act of swallowing.

Sept. 18th.—The patient thought the disease had been checked, but, upon close examination, this was found to be incorrect. He had not been quite so frequently annoyed by his food going into the nostrils, nor had he so much pain in the ear during the act of deglutition.

The same course of local treatment was pursued to-day, and repeated in the afternoon; and, in addition, prescribed a tonic and laxative, as his bowels were a little constipated. He left, feeling quite encouraged about his case.

Sept. 20th.—To-day the patient is fearful that the disease was pursuing its usual course, which, upon examination, was found to be the case. All that portion of the gum of the bicuspid above the top of the external alveolar process has disappeared, and about half of that on the inside of the tooth, but the ulceration on the soft palate has not progressed, and the pain in the ear was entirely relieved.

The local treatment previously used, which had a very soothing effect upon the diseased parts, was again employed.

Sept. 21st.—The disease is still advancing. The pain has been more severe in the ear and throat than at any previous time. The soft palate has a notch about 2‴ deep and 4‴ long, on the left side; both arches are so much reduced as to be scarcely recognizable; the left tonsil is entirely gone, leaving a cavity fully half an inch in depth; the glosso-epiglottic fold, on the same side, is also attacked by the ulceration.

At each visit it was observed that there was no swelling of the parts attacked by the ulceration, nor any pain, except slight when pressed upon, or in the muscles when in contraction.

The treatment to-day consisted in the excision of a portion of the healthy gum in the immediate neighborhood of the ulceration, so as to form a line of limitation on the cuspid tooth. This was carefully cut away and then thoroughly cauterized with arg. nit., and a pledget of cotton, saturated with a solution of chloride of zinc, grs. xx, water, f℥j, kept constantly applied. The remainder of the diseased surface was thoroughly sprayed with the carbolic acid solution, increased to four times the strength of that previously used. He was directed to stop the laxative and take three grains of quinine and ten drops of the muriated tinct. of iron at 7, 9, and 11 A.M. of each day.

Sept. 24th.—The patient presented himself to-day looking very much worse, and feeling very weak. He has lost nearly a pound in weight every day this week; has not been able to sleep without taking morphine every night, and has profuse perspiration as soon as he falls asleep. Pulse 96, small and hard; bowels constipated; appetite "pretty good." He could not take the iron, but has taken the quinine as directed; he has also taken some pills to operate on his bowels. The regurgitation of his food in the pharyngo-nasal space has been more troublesome. On examining his mouth, it was observed that the ulceration had already passed to the left lateral incisor. All of the surface of the excised portion of the gum was in a granular condition, looking worse than the parts that were treated only by the spray. The destruction of the soft palate by the ulceration continued, and was so extensive as to allow the fossa of Rosenmueller to be seen without the aid of the reflecting glass. The ulceration had extended down the left glosso-epiglottic fold, reaching the epiglottis.

The entire ulcerated surface was carefully cleaned by the spray of the carbolic acid solution, and then, with a small sponge, touched with a solution of the chloride of zinc, ʒj, f℥j, which occasioned considerable pain. He was supplied with a spray producer, and a bottle of the carbolic acid solution, and directed to make applications every two or three hours. The quinine was continued, and he was advised to take "home-made" beef extract.

Sept. 25th.—From information, received through his brother, I learned that he was too weak this morning to leave his room, but that the last application seemed to have checked the progress of the disease more than anything previously done for it. The carbolic acid spray had the effect of reducing the pain in the throat and ear, so that he did not require any opiate, but was compelled to use the spray nearly every hour during the day, and also whenever he awoke during the night. There was no change made in the treatment, as I had lost all hope of benefiting him by anything that I could do.

Oct. 10th.—I to-day visited the patient at his house, because of the interest I had in the case, and found him much reduced in flesh and strength, having all the external appearance of speedy death. For the last two days he has not been able to speak aloud. Pulse a little over 100, small and hard. His appetite is good, but he soon wearies in his attempts at swallowing, so that he does not at any time have his hunger appeased. Has continued pain in the throat and ear. Sleeps the greater part of the day and night, and always uses the spray of the carbolic acid solution as soon as he wakes up, whether the sleep has been long or short.

On examination it was found that the disease had extended to the right bicuspid, all of the incisors having dropped out, leaving the right cuspid very loose; none of the teeth showed the least sign of decay or change of color. The ulceration had extended upon the lower surface of the tongue on the left and in front; also nearly half-way across the fauces. The destruction of the velum palati was so extensive that, by throwing the head a little back, the posterior margin of the mouth of the left Eustachian tube could be seen. With the aid of the pharyngeal mirror, it was observed that the disease had extended upon the vomer, the inferior turbinated process, and upon the left half of the pharyngo-nasal cavity, and, by reversing the mirror, that fully half of the epiglottis, on the left side, was destroyed, and a part of the left vocal cord.

The treatment of the case at the time, and for a week past, except the use of the spray, was in the hands of the pastor of the church to which the patient belonged, who frequently attended to his parishioners when sick.

It is needless to say that death soon terminated the patient's sufferings.—*Dr. T. F. Rumbold, in Medical Archives.*

A CEMENT TO FASTEN WOOD TO OTHER MATERIALS.—It is often necessary to fasten objects of wood to others of metal, glass, stone, etc. The following cement, according to Dr. Ellsner, perfectly answers the purpose. Good cabinet-makers' glue is warmed up with water to the consistency necessary to connect wooden objects, then add enough sifted ashes to bring it to the thickness of a varnish. The cement should be applied to the surface of the objects to be united when warm, and then they should be pressed together tightly. After cooling and drying, the surfaces are so strongly united as to require great force to separate them. Grinding stones fastened on wood, and handles to painters' stones for grinding colors, have been used for more than a year without any appearance of fracture.—*Jour. of Applied Chemistry.*

HINTS AND QUERIES.

TREATMENT OF EXPOSED PULPS.—I have been perusing with much interest the various articles published in the DENTAL COSMOS, in relation to the treatment of exposed dental pulps. The various methods proposed by your correspondents for the treatment of such teeth seem to come far short of the success so greatly desired by the profession. The retention of the life and vitality of the pulp, in the full activity of all its functions, in the supply of vital forces to the tooth, is the great object to be attained, not its death and extirpation. This is now being accomplished by a goodly number of the profession. A short article on my method of treatment in such cases was published in the April number of the COSMOS for 1872, page 193. Since writing this communication, my experience has been considerably enlarged and extended. My treatment, which I claim to have discovered some three years since, is short, simple, and easily acquired by any one having even but little experience in the preparation of a cavity in which an exposed pulp exists, and which, perhaps, has been painful for days and weeks, or even months, previous to visiting the dentist. When we have presented to us an exposed pulp in any of the conditions in which exposure thereof is found, the first movement of the operator is to properly prepare the case for treatment, which preparation consists in removing all the softened dentine he can, without doing great violence to the pulp, and of so cutting down and preparing the borders of the cavity that future displacement of the covering of the pulp may not occur when ready for the insertion of a gold filling. In order to remove the decay without injury to the pulp, properly formed excavators should be used; small and finely pointed instruments will readily slide into the pulp-cavity and wound its contents unnecessarily. The points of our excavators should be broad and slightly rounded on the cutting edge, which greatly aids the operator to make all his preparations without doing much violence to the pulp.

When the preparation of the cavity is complete, it is very necessary to exclude all moisture from it by the application of the rubber dam, or any other method that will secure its dryness. Thus far all the conditions being properly secured, I then place two small parcels of white oxide of zinc on a small plate of glass or porcelain, one parcel being five or eight times larger than the other. The first, or smaller parcel, I now mix to the consistency of thick cream with wood creasote,—not carbolic acid. This mixture I gently apply to the exposed pulp, nicely covering it and the adjacent sensitive dentine, not thickly but lightly, at the same time keeping this first mixture as far removed from the border of the cavity as possible; yet covering closely all the sensitive dentine and exposed pulp. This being accomplished, I then mix the second, or larger parcel, with the chloride of zinc usually accompanying the packages sold in the markets, and formerly called os-artificiel. This mixture being a little softer than the first, I proceed to fill up the cavity with it to the fullness I may desire, being careful not to displace the first covering of oxide of zinc and creasote. This second covering becomes hard, and, if the first has been closely and properly applied, no pain will follow the application of it, as is usual in the direct application of oxychloride to exposed pulps and sensitive dentine. If the pulp has been painful, all pain will at once cease on the completion of the coverings, providing all the conditions have been carefully observed and properly executed by the operator. If the exposure of the pulp has been slight and recent, and has not been painful, I at once proceed to cut away enough of the second covering to admit of the insertion of a gold filling, thus completing the operation. But if the pulp has been largely exposed, and has been painful for some time, I allow my patient to depart, and remain away some ten days or three weeks before I insert the gold filling. All things being carefully and well done, almost universal success will attend the efforts of those who adopt the above method and perform the operation properly. But if a pulp has so far advanced in inflammatory action as to have assumed a state approaching dissolution, I know of no treatment that will reinstate and renew its former vigor.—JAS. S. KING, D.D.S., *Nashville, Tenn.*

THE RUBBER DAM AGAIN.--Having read several articles during the past year describing various methods of adjusting the dam, I have concluded to tender my *modus operandi*, and respectfully solicit a trial of its merits at the hands of those who are never so erudite in professional knowledge but that they can still learn a trifle. The fact of its not being original with myself will excuse the assertion of its superiority over any method yet brought to my notice, and that of its having been gleaned from an interview with an anomalous character,—a dentist who does not think much of dental societies,—would indicate that valued information can yet be derived outside the influences of our cherished organizations.

In the first place, I do not consider floss silk, gilling twine, or any other ligature, necessary for the adjustment of the dam, but rather for its retention afterwards. After it is in position, a ligature pressed between the teeth is very serviceable in preventing it slipping off. When a strong ligature is used to pass it between the teeth, the latter are frequently spread apart sufficient to admit a double thickness of the rubber and the ligature, and in those cases it is a very painful affair to the patron and extremely annoying to the operator. When the teeth are firmly set in the jaws, and the crowns are in close apposition their whole length, a force is frequently applied equivalent to the extraction of some teeth, and usually results in considerable laceration of the gum, if not manipulated by careful hands. Now, if we can adjust the dam in one-quarter of the time, spread the teeth to be isolated only one-third or less the distance, and prevent any injury to the gums whatever, is it not a duty to ourselves and our patrons to adopt such method ? Let us see.

Take a small piece of rubber dam between the thumb and index finger of each hand, about one inch apart, and stretch it to a length of three inches; apply one edge between two teeth closely in contact and see-saw it between them. Moisten both sides of the rubber with toilet soap before its application, and we have in full the *theoretical* principles involved in an illustration of my way of using this indispensable article. Now for the *practical.*

We wish to adjust the dam preparatory to excavating or filling a left superior second molar of a perfect denture. With a good-sized burr-drill we suddenly punch two holes in the rubber for the two molars, and with a small one, one for the second bicuspid. Then moisten it on both sides, contiguous to the incisions, with the best article of perfumed toilet soap. It is optional which one of the teeth is first isolated, but in this case the second molar presents the nearest approach to the bell shape, and for that reason we select it as the last one; this property assisting materially in retaining the rubber *in situ* under the severe strain anteriorly. Producing a strong tension on the anterior half of the first incision, we easily slide it between the first and second bicuspids. If there is a tendency to slip off we pass between them a piece of silk ligature, or, what is preferable, a segment of a thin section of proper-sized French tubing, which contracts afterwards and acts as a keystone in the angular space. Next, stretch the intervening links, present them to their proper spaces, and they will slide in like "greased lightning" compared with the tugging and pulling of the old nag. And finally apply in the same manner the posterior edge between the second and third molars. We hold it there with the fingers of the left hand astride the arch, or in any manner that is most expedient and will not farther distend a very open countenance, and with the right hand apply the clamp. It is frequently preferable to adjust the dam and apply the clamp first to the posterior tooth, and then finish those anterior to it.

With the exception of a few rare cases in which the antagonizing surfaces of inferior molars and bicuspids indicated an approach to osseous union, I have never yet met with a case in which I could not easily adjust the rubber dam in this manner. For nearly a year I have applied the dam before excavating, and never use a ligature to insert it between the teeth. Try it and report.—S. S. Southworth, *Niagara Falls, N. Y.*

A Case with Mack's Screws.—A gentleman about seventy-three years of age, of full habit and vigorous constitution, called at my office and complained of extreme sensitiveness in the two inferior canines and first bicuspid below on the left side. The cause was very apparent to be the result of mastication and the mechanical abrasion of the teeth.

I had but a few days previous procured a set of Mack's instruments, and it seemed to me a capital chance to try the utility of them. A day or two afterwards he came, by engagement, and I at once commenced to carry out my plans on the three teeth mentioned; the surface was worn perfectly flat and smooth, sloping toward the buccal side on each tooth.

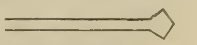
I applied the rubber dam, and commenced operations by drilling four holes with number two drill, and then with the top of the same number I cut a thread to the bottom of each hole, after which I inserted the screws, the holes being drilled so as to incline from each other; then, with a small pit drill, I made two retaining points to start my filling from, and with Pack's crystal gold, a mallet, and suitable instruments, I built three caps the full size of the crown of each tooth, and about one-sixteenth of an inch in height. After a suitable filling and polishing of the "gold caps" and the antagonizing teeth, so as to make a perfect articulation, I discharged my patient, much to my satisfaction, and seemingly to his.

I have seen the patient since, and, to use his own expression, "the teeth are first-rate, and sound as a nut."

No dentist that wants all of the useful improvements in our profession can afford to do without these screws.—F. J. Moyer, *Lockport, N. Y.*

Amalgam Fillings.—At college I was taught to remove amalgam fillings with excavators, burr-drills, etc. Armed with these, I dreaded one of those monsters more than I did a quiz by one quaint old professor, who, after I had answered a question, would always ask me what I meant by such and such words I had used. I mentioned my troubles to several dentists, but could get no help. One doctor told me he too was perplexed: "he had to cut away so much of the tooth in order to get the plug out."

About a year ago I noticed how easily a machinist was drilling holes in brass. It occurred to me that a drill like his would work well in an amalgam filling. I requested him to permit me to examine it. It was made in this way. It had two cutting edges,—one on either angle,—ground so that both edges would cut when the drill was rotated to the right.



I made several sizes of these to fit a socket-handle, and tempered by leaving the straw color at the cutting edge.

I made a depression in the center of the next amalgam filling I wished to remove, to prevent the drill from slipping off, and put it to work. I was astonished at the result. In less time than I can write this the plug was out. Some care is necessary to prevent the drill from passing out of the amalgam into the tooth.—E. W. ANDERSON.

VULCANIZING CELLULOID.—Observing that celluloid plate would stand 3·26° of heat in sweet oil, and desiring to learn some better way to mend celluloid plates, I determined to try vulcanizing. Accordingly I prepared a piece of celluloid and a rubber block, and packed it exactly as I would in mending a case of rubber. About the time the mercury had reached 300° the vulcanizer's cap was raised by a fearful force, and the celluloid escaped from the flask in appearance like soot. I feel thankful that my brains were not blown out. I have very little doubt that it would blow any vulcanizer to pieces, providing the lid was put tightly down, which was not the case with mine.

Although the celluloid was burned to soot or coals, the rubber was not injured in the least that I could observe, and but slightly vulcanized. I write this lest somebody as ignorant as myself should try the same thing, and not escape so fortunately as I did.—EXPERIMENT.

TO HARDEN PLASTER.—I make use of either a thin milk of lime or lime-water, instead of ordinary water, and add to this about ten or fifteen drops liq. silicate of soda for every pint of fluid used; then thicken with plaster to a thick cream. Plaster thus prepared will set in about five minutes, dependent on the thickness of the cream. The addition of lime evidently prevents the formation of sulph. soda, reducing it to a caustic condition, and thus allowing the plaster to stand a very hot water, besides making it very hard. If, however, too much silicate is used, the soda will effervesce on the surface, and spoil the sharpness of the impression.—J. F. W.

REPLANTATION OF TEETH.—The late numbers of the DENTAL COSMOS and other dental journals have had articles reporting the successful replantation of extracted teeth; each report, however, being that of the replanting of a single tooth.

As an advocate of the practice of replanting teeth, I report two instances of successful replacement of *several* teeth in proximity.

The first was that of a gentleman who was kicked in the face by a horse. The superior incisor teeth were completely dislodged from the mouth, remaining out an hour or more before the patient was attended by my friend and preceptor, Dr. H. Parker, of Edgefield, S. C. The four teeth were replaced by him, and so successfully treated as to become healthy and firmly implanted in the jaw.

The crown of one of the lateral incisors was so broken that it was afterwards removed, and an artificial one substituted on pivot. The teeth have been doing good service now for about four months.

The other instance was that of a gentleman who received a gunshot wound in the face, by which he lost several front teeth. Two of them, superior lateral and cuspidators, which he found, were replaced with his own hands. They became firm and useful without regular surgical treatment.—B. H. TEAGUE, D.D.S., *Aiken*, *S. C.*

REPLY TO "M."—"Who owns Patent on Porcelain Base?" Dunn & Loomis are the patentees. Isaiah Lukens, whose address is Newport, Delaware, can give any desired information.—K.

THE

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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S., in the Office of the Librarian of Congress at Washington.]

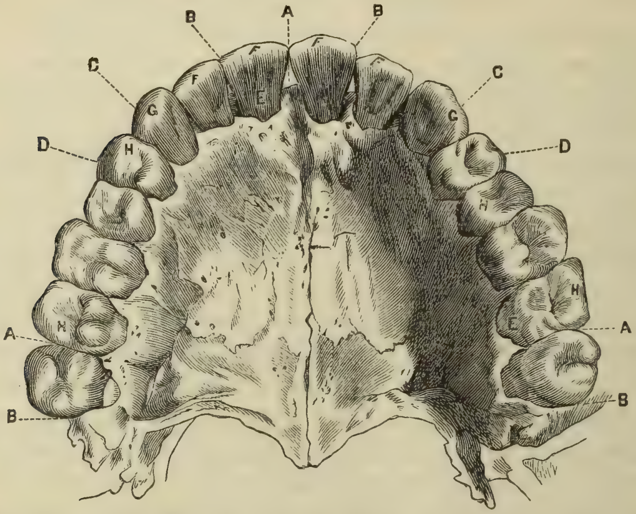
(Continued from page 343.)

WITH the full development of all the third molars, or "wisdom teeth," we have the completion of the permanent set of teeth. These are thirty-two in number,—two central incisors, two lateral incisors, two cuspids, two first bicuspids, two second bicuspids, two first molars, two second molars, and two third molars, in each jaw.

An examination of many sets of teeth almost immediately impresses the observer with the necessity for a first natural division of these organs into four classes, corresponding with the four great divisions of temperament, those of the *bilious* temperament being firmly fixed in the jaws, of dense structure, well developed, proportioned for strength, and yellow in color. Those of the *sanguine* temperament being but little less firmly fixed in the jaws, of but little less density of structure, with much beauty, combined with strength, possessed of translucency, and of a rich, light cream color. Those of the *lymphatic* temperament much more loosely held by jaw tissue, of soft structure, of dull, waxy opacity, usually largely developed, but possessed of neither beauty nor strength, and of complexion variably pallid. And those of the *nervous* temperament, which are moderately firmly fixed in the jaw, of comparative density of structure, of fine organization, of delicate beauty of form, but devoid of indications of solid strength, having great length in proportion to their breadth, with fine cusps and thin cutting edges, and possessed of a pearly blue color together with a brilliant translucency.

Regarding these as basal characteristics, we at once recognize in the mixed temperaments with which we are brought into professional contact that blending of traits which gives us the firmly fixed, dense, beautifully-developed, light-yellow teeth of the bilio-sanguine, or the yielding, soft, opaque, pale blue teeth, delicately organized, but not possessed of beauty, which pertain to the nervo-lymphatic temperament, —I say which pertain to, but to my apprehension it were far better if I should say which *indicate*,—for an extended experience, both general and special, has impressed me with the conviction that the teeth afford us guides to knowledge of conditions, temperamental, local and systemic, which is unsurpassed, and indeed unequaled by any other indication; as temperamental guides, they offer those nice admixtures of structure, form, color, and sensation, which give the surest base for treating any condition in connection with which success is markedly dependent upon attention to individual peculiarities; as guides to local troubles, particularly gastric, uterine and ophthalmic, but by no means confined to these, the teeth are very frequently absolute in their indications; as guides to systemic condition, the teeth not only act as corroborative evidence when existing difficulty has become pronounced, but oftentimes, and indeed *almost invariably*, point, through their pathology, to the existence of efforts toward the maintenance of integrity upon the part of the system, which are unnoticed alike by patient and general practitioner. So valuable are they as diagnostic in this connection, that I feel constrained to add my testimony to that of former writers upon my specialty, and earnestly urge attention to that which I shall offer in this direction, together with such observation upon the part of all interested in pathology, whether general or special, as shall tend to disseminate views which have impressed most those who have most observed.

Fig. 1.



Together with the necessity for the temperamental classification and subdivisions of teeth already referred to, it also is found essential that names should be given to the various faces of teeth, in order that position may be defined in explanations concerning conditions and operations. The diagram used to illustrate this second need is a portion of Figure 1, Plate iv., from Hunter's "Natural History of the Human Teeth," 1771, and from the variety of nomenclature which has been suggested I accept the following:

A. A. A.	Mesial—toward the central line.
B. B. B. B.	Distal—away from the central line.
C. C.	Labial—towards the lips, from cuspid to cuspid inclusive.
D. D.	Buccal—toward the cheeks, from first bicuspid to third molar inclusive.
E. E.	Palatal—sup. jaw Lingual—inf. jaw } toward the hard palate or tongue.
F. F.	Cutting edge—pertaining to incisors.
G. G.	Cusp—pertaining to cuspids.
H. H.	Articulating—pertaining to bicuspids and molars.

These names, either singly or compounded, as mesio-articulating, disto-buccal, bucco-articulating, etc., or in connection with the various sulci upon the crowns of teeth, as mesial sulcus, distal sulcus, buccal sulcus, etc., will be found sufficient for all practical purposes.

Having now tangibly placed before the mind those organs which, considered from the standpoint of disease and means for relief, constitute Dental Pathology and Therapeutics, it seems that the first palpable deviation from normality upon the part of an otherwise normal tooth is the permission of the establishment of that condition known as

DENTAL CARIES,

and as, in the other considerations which have been offered, it has been deemed advisable to commence with the microscopic inception, so it is with this subject. Indeed, I propose giving, as cause for this expression of disease, a systemic influence defying as yet even microscopic research, of the existence of which, however, we have no possibility of knowledge until by microscopic examination we pronounce the presence of caries with its chemical, mechanical, and parasitic concomitants, announced by acid or alkaline reaction, abrasion, and growth of fungi, together frequently with that increase of sensation shown by the application of the sweet, sour, hot and cold tests, which is indicative of a degree of altered action, dependent upon vitality, which is as analogous to the inflammatory condition of soft parts as is consistent with the peculiarities of enamel, cemental and dentinal structure. It seems unnecessary even to mention the grounds for any of the one-idea theories of dental caries, for it is indisputable that each and every one that has ever been promulgated is partially correct, in that each performs a part; while on the other hand all combined seem only to act when the formative power of the tooth tissue, dependent of course upon the degree of vitality of the organism, is inadequate to complete perfection and preservation of structure. For these reasons I deem it advisable to discuss the subject in hand upon the broadest basis, and shall earnestly endeavor to present such views as will tend to the more generally successful treatment of this evidently increasing malady.

Predisposing Causes of Dental Caries.—The predisposing causes of dental caries will he considered under two divisions. First, General: this subdivided into—1. systemic; 2. thermal, chemical, and parasitic. And second, Local: subdivided into—1. structure; 2. form; 3. position.

First, General—1. Systemic. In considering the systemic predisponents to caries, a field is at once entered which it seems alone ought to silence the oft repeated slur that "nothing is known of caries; that caries is the opprobrium of dental pathology; that caries marches triumphantly despite the best efforts of dental science;" for such is not the truth; even from the systemic standpoint, caries is combated with a respectable degree of success, and when to this is added a faithful co-operation of competent practitioner and anxious patient, the results obtained challenge the presentation of an equal proportion of success in any direction of even the practice of any other specialty of medicine, and leave all records of general practice far in the background. It is the claim of the present day that dentistry is the best advanced specialty of medicine, and this claim we could not for a moment sustain were not potent weapons skilfully wielded in the prosecution of the war with dental caries, and that too with notable success, even with all the fearful odds against us. Assuming then that the teeth, being a part, and an exquisitely organized part of the vital economy, are necessarily under the domination of vital influence, we must recognize that all influences tending to depreciate the *great* power of vitality must affect first and most seriously such portions of the organism as are not absolutely essential to vitality, for, in accordance with the first law of nature, "life" seeks self-preservation. This, experimental observation shows to be the case, and thus it is that even while there are no indications to the patient of want of vital force, the presence and progress of caries, in perhaps only one or two of the teeth, sounds the warning note of alarm to the dentist, and when still more rapid and more extensive ravages occur, which threaten to sweep away the teeth, —non-essential to vitality (but how essential to high health!),—even then the patients often ask the cause of this decay, "when they are never sick!" *We* recognize how utterly the teeth have to be sacrificed in order that the rest of the economy shall *seem* to be well. Again, in conditions of typhoid, when the life force has fortunately been sustained, when the depressing influences have been so *tartly* fought as to have induced a convalescence, what is so constantly neglected as the hair, the teeth, and the functions of the special senses? The hair falls, the teeth decay, the sight is dim, the hearing dull, the taste weakened; little by little the hair bulbs resume their labors; in time the sight, the hearing, and the taste return; but the bulbs are refreshed and invigorated, if only—and perhaps best—by the washings of cool water and the rubbings of coarse towels; the sight is rested, all injurious effort being carefully avoided; the hearing recuperates because of the immense recuperative power which would naturally be expected from the deep-seated origin of the auditory nerve; and the taste is stimulated by the "daintiest the market can afford": but the teeth—these, which from the presence of already existing cavities of decay are no longer in any degree self-protecting; these which are always moist and warm; these which are always first abandoned and last rescued,—even these, by thorough dental manipulation and most of all by thorough dental medication, are snatched, as it were, from ruin, and held almost intact in defiance of everything. This is no fancy picture, but the mouths of thousands are the vouchers for the truth of my assertion. Again, we find the teeth to suffer in large proportion with all the other tissues, and thus it is that with the physical retrograde, that is too apparent to even need assertion, we find a tooth structure far less capable of resistance than that which pertained to the fathers and grandfathers of the present generation; and this being so upon the male side of posterity, we find even less capability of resistance on the part of the female descendants of our mothers and grandmothers; *and yet* by education of the parents, and by exercise of proper care upon the part of the children, all due to skillful dental supervision, we find hundreds of complete dentures in the mouths of patients twenty years old, whose parents were minus half their teeth at a like age. The retrograde in quality of tooth tissue is due to pampered modes of living, and is by no means confined to these organs. So far from this is true, that the prevalence of dental caries can but be regarded as the greatest outcropping of that systemic condition which in more marked cases induces the want of muscular development in the male; the want of shapely fullness in the female; that want of healthy color so prevalent; the frequency of want of appetite and want of digestive power; the numerous instances of biliary and renal troubles; the too general failure of sight; the long catalogue of nervous affections, from tendency to chorea to general nervous prostration,—all these *peculiar* evidences of deterioration must be regarded as resulting from the same causes that are pointed at by the finger-post of dental caries. The change, too, which has been forced upon the practice of medicine during the past thirty years is very significant. It is frequently remarked that "happily the old-fashioned barbarities of blistering, purging and bleeding, have given place to more rational methods of practice;" but this is not due to change of ideas mainly, but to *change of indications.* The diseases of former years were marked with the type of violence; they ran their course with quickness and with power; they were for the most part *acute* in their character, and thus demanded an energy of combat which is not now required in other than exceptional cases. This fact is recognized most clearly by old practitioners of all schools, and can be accounted for upon no other grounds than those we credit with being the cause of diminution of resisting power upon the part of dental tissue, and the concomitant increase of dental caries.

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 350.)

The Oral Group.—The *orbicularis oris* is a true sphincter, and is by some called the sphincter oris. Occupying the entire thickness of the lip, it gives it the fleshy character so characteristic of this portion of the face. As a rule, the fibers of the upper lip are better developed than the lower, and their plane takes a more advanced position in the profile, while the demarkation line between the skin and mucous membrane is more sharply defined in the upper than in the lower lip. This is especially true of the lip in the young subject. We find that the human face as represented in Greek sculpture possesses a redundant upper lip with flexible angles. It gives a sensuous expression to the otherwise severe countenance. This is a mannerism due to the peculiarities of the Greek model, which, as is known, is based upon the proportions of the adolescent.

The upper lip is marked by a vertical median groove, the *philtrum.* It is believed by some authors to represent a weak point in the upper oral fibers. This opinion can receive no support from analogy. The depression below the lower lip is caused by the fixation common to all the proper chin tissue at the symphisis of the jaw, abruptly ceasing near the inferior margin of the mobile lower lip. The muscles of the oral group are arranged as radii to the ellipse of the orbicularis. The elevators and depressors of the lips are placed more or less vertically to the upper and lower fibers respectively; but the elevators, depressors, and adductors of the angles, are placed obliquely to the angles: the two first mentioned from the angle outward,—the last mentioned from the angle inward. For example, the elevators of the angles,—the *zygomaticus* and the *levator angulis oris,* find points of origin to the outer side of the angle above; the depressor—the *depressor anguli oris*—to the outer side below; but the adductors, the *M. incisivus labii inferioris*, and *M. incisivus labii superioris*, of Henle, which are the same as the "special fibers" mentioned by Gray, "by which the lips are connected directly with the maxillary bones and septum of the nose," pass chiefly from the alveoli outward into the angles. Now the oblique are collectively more powerful than the vertical fibers. It is to this circumstance that expression is localized to so great a degree about the angles. Sir Charles Bell, in his classic essays on the *Anatomy of Expression*, has said that "the parts of the human face the most movable and the most expressive are the inner extremity of the eyebrows and the angle of the mouth." Of the two localities, the preference should be given to the latter. How few emotions are interpreted which do not call upon the muscles effecting changes at the angle of the mouth? And in the countenance which retains an expression in reserve,—where the tonicity of the parts are the only telltales,—how important a feature is the angle in study of physiognomy? Its position remains fixed in all conditions of nutrition. In the plump face of youth, before the rigid lines of maturer years are formed, or even at this time, when "sorrow hath struck so many blows and made no deeper wounds," the angle appears receding. The play of expression about it, as it lies shaded from the full outline of the cheek, adds to the beauty of the form as much as the tint of the skin gives warmth of color.

The only acts the orbicularis can perform unassisted are those pertaining to its proper use as a sphincter. Whistling and sucking are conspicuous among these. The vertical and oblique fibers perform more complex duties.

To speak first of the elevators of the upper lip. The thin sheet of muscular fibers extending from the side of the nasal process of the superior maxillæ to the lower edge of the orbit to above the opening of the infra-orbital canal, and divided into slips,—a nasal and a facial,—passes downward to be inserted into the alæ of the nose and the upper lip. Henle calls this muscle the *M. quadratus labii superioris*. We are in the habit in our schools of denominating each slip under a distinct name,—the nasal slip as the *levator labii superioris alæque nasi*, and the facial slip the *levator labii superioris*; while to the latter may be added the *zygomaticus minor*. Let us pray that the time may soon come when we can sweep away such pedantic rubbish from anatomy! No conscientious teacher can permit himself to employ two names where one does as good service. When the muscle contracts, it elevates the side of the lip and the wing of the nose. We have alluded to its harmonious action with the orbicularis in violent squinting. Owing to the slight convergence of the muscles of the opposite sides, when both contract the skin of the side of the nose is raised into oblique folds, the brow descends, and the lip and sides of the nose ascend, so that the root of the nose is wrinkled transversely as well, and the lower eyelid is pushed up and thrown into transverse wrinkles.

The elevation of the lower lip is, as a rule, associated with a little tension of the angles, and it is from the appearance of this shape in expressions of assumed dignity, that the muscle is often spoken of as the *superbus.* During its action the integument of the chin is corrugated. The depression of the lip is a simple act, to which the platysma myoid is in part accessory.

The tractors of the angle will now take our attention. The *zygomaticus major* and the *depressor anguli oris* are about on the same plane. The *levator anguli oris* is on a much deeper one, almost indeed, if not quite, on a plane with the buccinator. The fact that there are two oblique tractors above and only one below, shows with what greater ease we raise the oral angles than depress them.* The "*mens sana in corpore sano*" lifts the emotions, as it were, and so adjusts the apparatus of expression that the face is ready to break into a smile at the faintest provocation. In so doing, the cheek tissues are shortened along the axis of the elevators, noticeably that of the *zygomaticus.* A deep groove is formed, extending from the upper margin of the nasal ala toward the angle. If the cheek is full, and the deposit of fat abundant, it is not wrinkled, but pushed up, raises the lower eyelid, and makes many "crow's-feet" about the outer angle of the orbit up to the line of the brow. If, in the child, the skin of the center of the cheek is united to the berry-like lobule of fat which lies alongside of the anterior border of the masseter, a dimple forms at that point.

Now the naso-labial groove is not a simple line, but is composed of two, one starting at the depression about the alæ, and is lost upon the margin of the orbicularis. This line is sometimes double in old men. The second lies about three or four lines beyond the oral angle.

The union of these lines into one is not apt to occur before middle age. The first lines we have often found associated with the points of insertion of the elevator of the lip, and the second invariably corresponds to the other edge of the orbicular fibers. The *depressor anguli oris* in contracting exaggerates the naso-labial groove, and when both operate the lips are curved downward and compressed. Forced contraction of the depressors, with depression of both lips, will of course destroy the naso-labial fold. In old age the angles droop, and a new groove, passing down directly from the ends of the oral fissure, leads to the jaw, while both lips are furrowed by numerous vertical wrinkles. What we have termed the angle, in introducing our remarks upon the subject of expression of the oral region, is to be used in a different sense from the same word when used to indicate the point where muscles are inserted. The latter are invariably received within the lateral fibers of the orbicularis *at* the angles. These form in a dissection of the muscles of the face a firm muscular mass, continuous upward to the elevators of the angle, downward into the single depressor, and outward into the buccinator. It is held against the canine teeth, and gives a passive expression to the "set" mouth of the adult, and limits laterally the labial vestibule, as distinct from the buccal. If we take a mouthful of air and throw it across the mouth from side to side, as in gargling, the lower jaw being elevated, we are conscious of the exactness and firmness with which the oral angles reapply themselves to the canine teeth after removal of the tension of the cheeks.

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* Observe the placid expresssion of the face in the robust victims of sudden death.

Thus, we find facial expression limited to a few acts, which are grouped about two centers: the inner extremity of the brow and the angle of the mouth. The formulated descriptions of these acts are crude, compared to the subtle combinations employed in every-day intercourse of thought and feeling. We might compare the difference between the two to the analysis of the laryngeal muscles of a bird, and the attempt to explain thereby the exquisitely modulated song poured tumultuously from its throat. But we do not essay the æsthetic studies to which the contemplation of this subject would naturally lead us.

To the professional man the facial expressions are of great value: they inform him of the prevailing tendencies of the mind; prepare him for the difficulties he will encounter, besides guiding him in his selection of artificial dentures. No dentist neglecting the relations between facial and dental expressions can reasonably hope to achieve the highest success. He should, therefore, make a study of faces, searching for meanings among their folds and depressions, and, by studying the wrinkles of others, gain a useful "wrinkle" here and there for himself.

(To be continued.)

SHOULD DENTAL OPERATIONS BE PERFORMED DURING PREGNANCY?

BY A. J. REDERICK, D.D.S., SIOUX CITY, IOWA.

Dental histology, dental materia medica, filling teeth, and mechanical dentistry have been written upon, discussed, and criticised until I trust they are well understood. But, assuming that we are familiar with these subjects, it is of importance for us to decide when and how to apply this knowledge, when to use the means at our command to arrest the destructive action of caries, or to alleviate suffering by extraction. If only males were our patients, we might set it down as a rule, if the patients were in any possible state of health, to operate without hesitation. But the most of our patronage comes from the other half of the community; shall we make no distinction in this respect with them? Should it make any difference whether a lady is pregnant or not? Will this condition have any influence on the success of our operation, or will it affect the mother or the unborn child?

Before giving an opinion on the subject, I would like to consider some of the essential conditions for success in dental operations.

Thoroughness is one of the first necessities toward permanency in our attempts to arrest caries. All portions attacked, except that in contact with the pulp,—certainly all which forms the margin of the cavity of decay,—must be removed.

Frequently a great amount of tissue before securing sufficient marginal firmness and space must be cut away by the chisel or file; wedges must be inserted; portions of dipping gum cut or forced away; retaining points, or other means of securing anchorage, cut into highly sensitive dentine, and the application of sheet-rubber, rubber rings, strings, or napkins must be made to prevent ingress of moisture; hundreds and thousands of strokes of the mallet or pushes of the plugger to consolidate the gold must be made, and to do all this requires in some cases several hours.

If the subject of such an operation be blessed with a great amount of resistive force, if there be but a small amount of nervous sensibility or irritability, the operator succeeds all the better.

Are these conditions likely to be secured in the female sex during pregnancy or the menstrual period? Let us inquire into the state of the human female during gestation.

Neither pregnancy nor the catamenia can of course be considered abnormal conditions, but physiological processes; nevertheless, we find the nervous system during this period very susceptible. Impressions of the most trivial character, which, under ordinary circumstances, would pass unnoticed, readily disturb the functions of the cerebro-spinal axis, producing frequently powerful and lasting results affecting not only the mother but also the child in utero. Disagreeable or disgusting sights may so affect her as to injure her health, arrest the process of development, or produce abortion or premature labor. Grave apprehensions as to the condition of the child—a fear of its being born imperfect—often exist. The time of labor is looked forward to with fear and despondency. In Dr. Hodge's excellent chapter on pregnancy he says not only are the mental and moral faculties of the patient disturbed, but there are innumerable manifestations of *physical disorders*, depending directly or indirectly upon the brain as the center of nervous influence. In some merely a sense of depressive weakness or exhaustion, in others prostration amounting occasionally to syncope, crazy headaches, violent pains in the eyes, face, ears, and teeth, not seldom accompany this condition. Many patients have nothing to do with the dentist except during pregnancy, because only then do they have any trouble with their teeth. The nervous system is so irritable that morbid impressions are produced on almost every organ, interfering with every function of the body. The heart may be affected, causing palpitation; the functions of the lungs may be disturbed, producing a feeling of tightness about the chest, with difficulty of breathing.

Gastric symptoms are of very frequent occurrence, being in fact considered among the positive signs of pregnancy, and so common as to have received the name of morning sickness, indicative of that condition. The taste becomes perverted; the patient longs for various articles of diet without regard to their fitness as food. That these symptoms are caused by the action of the gravid uterus upon the stomach is evident, from the fact that after delivery or abortion they immediately cease. How the gravid uterus acts so as to produce these results is yet a matter of speculation. It is generally supposed to be sympathetic or reflex, the highly excitable condition of the nerves of the uterus acting upon those of the stomach, through the great sympathetic.

Knowing the intimate relation between the ganglionic and cerebro-spinal systems, it is not difficult to understand the effect of outward impressions through the senses. The sight of particular kinds of food is often sufficient to produce emesis, or even the thought of something that has once produced it.

Whatever the rationale, the effects exist, and often fill us with dismay. We may have been faithful in the discharge of our duty towards our patient when filling her teeth; our injunctions may have been carefully regarded; yet the result we find unsatisfactory. Solid gold plugs, highly polished, good margins, close contact, may avail nothing; caries cut, around the fillings at the necks of the teeth, grooving them in such a manner as to baffle us in our attempts at restoration, and if we did restore these grooves and gaps with gold plugs, what of their future? If the same conditions again hold control, they will shape the results in spite of us. I have no doubt that many of you have had patients, for whom you have inserted what are called first-class fillings, return after being under the care of a physician for some temporary ailment with discolored teeth, sensitive to thermal change, and many of the plugs tottering for want of marginal support. They had been put under a tonic course of treatment. They had taken tincture muriate of iron or other preparation equally as acid; perhaps they had taken it through a quill or some other tubing, but still the teeth are injured, when, if a little pains had been taken in directing an antacid mouthwash, it would have prevented such destructive results. Some physicians seem to ignore the importance of the teeth; they in fact, in some portions of the country, doing most of the extracting, pandering to the desires of the patient regardless of future consequences in disorders of the stomach and of the general health. We have most frequent during pregnancy what is called soft caries, caused by the rapidity with which the phosphate of lime is removed, leaving the organic portion with its dental fibrils, or whatever you may call the contents of the dental tubuli, exposed to irritating agents or to the cut of the excavator; nor does decay confine itself to any definite location, as is the case under other circumstances,—such as points of contact, fissures in bicuspids and molars. On the contrary, it is those portions which are usually exempt, the necks of the molars and bicuspids, both lingual and buccal, and the labial neck of the incisors and cuspids, that are attacked and become excruciatingly painful; sensitive to thermal changes and irritating substances.

Again, during pregnancy the whole system is excited sympathetically with the enlargement of the uterus. The kidneys are frequently congested from pressure made by the enlargement of the uterus; according to some authorities, it is the cause of albuminuria. Cazeaux goes so far as to state that it is the physiological condition of the urine in pregnancy, and becomes a disease only when exaggerated. Other writers are of the opinion that albuminuria is a cause of the dropsy which is often present during this condition.

That a strong resemblance exists between the conditions of the fluids and the functions of the system in pregnancy with those of anæmia, chlorosis, and Bright's disease, there can be no doubt. Cazeaux runs a parallelism between pregnancy and chlorosis, maintaining that in both there is an excited state of the uterus, causing an impoverished condition of the blood and the various nervous and vascular disturbances, viz., dimness of vision, cephalalgia, tinnitus aurium, hard pulse, palpitation of the carotids, and local congestions, giving rise to epistaxis, uterine hemorrhages, etc.

A view totally the reverse of this obtains among practitioners of equal eminence, maintaining the condition as one of *plethora*, characterized by excitation in the circulatory system, fullness of the pulse, a feeling of distention over the whole body; also a great increase of the excretions, with a corresponding increase of the secretions.

Those maintaining this view of the case treat their patients with the view of reducing the circulation. The others make use of tonics to build up and stimulate. In the management of pregnant women, the thoughtful physician pays particular regard to the mental condition, the nervous system, the stomach, and kidneys, advising quiet, moderate exercise, the avoidance of everything that may cause shock or produce unpleasant impressions which might affect the child by the influence which the nervous system holds over the circulatory—the only connection existing between mother and child.

Dr. Hodges remarks that in cases of odontalgia the practitioner should not too readily yield to the anxieties of his patient for relief, and allow severe operations to be performed upon the teeth, as no relief may be afforded and mischief produced. Dr. Robertson, in his treatise on extraction, "does not regard pregnancy as a valid objection to the extraction of aching teeth." Dr. Garretson, in his new work on *Oral Surgery*, says, under the head of Pregnancy: "It is not generally thought that there is anything in this condition objectionable to the use of chloroform. But most authorities I have examined upon this subject seem to ignore the teeth altogether." Churchill states that odontalgia is the most common of all the neuralgias of pregnant women.

Mauriceau considers bleeding the best remedy for the toothache of pregnant women. Jacquemier says that we should cauterize the tooth, as most authors think that extraction might cause abortion, and it would be well to advise patients not to undergo the operation.

Of the mischief that sometimes follows severe dental operations, none are more frequent than abortion. Indeed, where the patient has once miscarried, it is extremely probable that a very slight cause will again produce it, this result seeming to depend more upon the susceptibilities of the patient than the severity of the operation; the thought of being hurt is often as injurious as the pain produced by the surgeon's knife. We have reason to believe that pregnancy may produce this condition in females naturally brave and fearless.

The extraction of an aching tooth, especially when there is severe peridontitis, may so disturb the nervous, respiratory, and circulatory system, as to produce a shock sufficient to cause a miscarriage.

Shock does not depend so much upon the magnitude of the lesion as upon the susceptibility of the patient. If the mind be absorbingly preoccupied, or if the person be under intense excitement, as in a fracas, a severe wound may be inflicted, and the party not be cognizant of the injury until his attention is called to it by others, or by the presence of blood. But if one is anxiously awaiting the cut of the lancet and the application of the forceps, the pain inflicted is most severely felt. Shock will, however, follow severe lesions without regard to moral or mental influence, as instanced in experiments upon the lower animals.

Are, then, dental operations a sufficient cause to produce upon the mother a mental impression capable of affecting the proper development of the fœtus? A case occurred in my practice some years since which seems to bear upon this question. Mrs. G. came to have four incisor roots extracted, which were all removed without much difficulty, except one. This required some little cutting, on account of the gum tissues covering it completely out of sight, but even this was removed without serious trouble. On leaving the chair, she made use of the expression: "I feel as if I had no mouth in front." Six or seven months after, she was delivered of a child which had some defect in the superior maxilla, which prevented it from nursing, and consequently it died in a few days. I was not fortunate enough to see the child, but suspected that it was a case of cleft palate. I asked the attending physician, with whom I was on intimate terms, who assured me that it was not a case of cleft palate, as both anterior palatine bones were wanting. This was the result evidently of a lack of development. I am not prepared to say that this was caused by the impression made upon the mind of the mother by the extracting of the roots, though she refers it to that cause.

Montgomery relates cases in which malformations in the infant appear distinctly traceable to strong impressions made on the mind of the mother some months previous to parturition.

Dr. Carpenter cites a case in which a near relative of his brought forth a child, malformed as anticipated; the impression was produced during the first months of gestation. He further says:

"When it is borne in mind that during the entire period of gestation the embryo is deriving its nutriment exclusively from the blood of the mother, and that the condition of this fluid in relation to her own processes of nutriment and secretion is subject to a very marked influence from her own mental state, it cannot fairly be thought improbable that the developmental processes of the embryo should be powerfully affected by strong emotional excitement on her part."

Filling teeth properly under such circumstances cannot be done without inflicting severe pain. If we are possessed of any feelings of sympathy, we must shrink from inflicting the pain necessary for successfully completing the operation. If we persist, in order that our work may bear the test of time, we may fail in a most important particular. Our fillings may stay, but our patient may desert us.

I consider it far better practice to defer all but absolutely necessary operations until the patient is in a more favorable condition, using soothing, palliating means.

I would insert temporary fillings to arrest decay for the time being, and advise antacids to neutralize and counteract the acid conditions of the oral fluids. Necessary operations I should not hesitate to perform, but would endeavor to excite as little fear as possible.

If I could not combat violent peridontitis or threatening abscess, and the tooth were so badly decayed as to be past saving—worthless—I should not hesitate to extract it, and in doing so, if I had an extremely nervous subject to deal with, I would prefer to give an anæsthetic rather than run the risk of the effect of the shock. In this case I would consider the safety of the operation without anæsthetics more dangerous than the danger to be apprehended from the effects of the anæsthetic. Again, in cases of exposed pulp, our attempts to save this organ will prove most discouraging, not only from the irritability and impatience of the patient, but from the fact that so great a demand is being made upon her system for the phosphates which go to build up the anatomy of the new being. We must recollect that our civilization has forbidden physiological living. We throw out the very principles necessary to make bone from our staple, bread. The blood not containing this element in sufficient quantity, a demand is made upon the parent system, with the consequences we have already mentioned as affecting the teeth. Now the exposed pulp, when capped, fails to throw out what it has not at command, and cannot shield itself by a deposit of secondary dentine. Thus, it is asserted by surgeons of extensive experience that fractures unite with much more difficulty during pregnancy; that non-uniting fractures are more numerous, and all efforts at irritation will sometimes prove fruitless until after delivery.

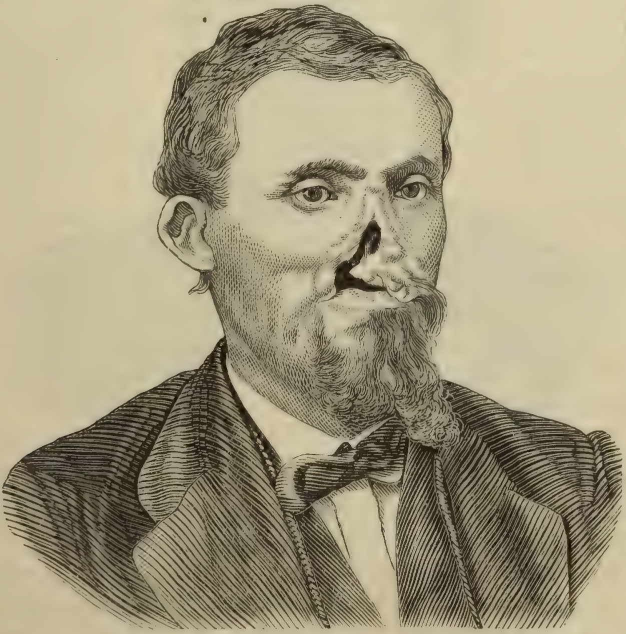
I give it as my opinion, that the less we interfere with the dental organs during pregnancy, otherwise than by palliatives, the better.

ARTIFICIAL APPLIANCE.

BY W. M. HERRIOTT, D.D.S., ZANESVILLE, OHIO.

Corporal Andros Guille, Company K, 97th Regiment Ohio Volunteer Infantry, aged 32 years, was wounded November 25th, 1863, at the battle of Mission Ridge, by a fragment of shell, which carried away the entire nose to the turbinated bones, and the upper lip, with anterior

Fig. 1.

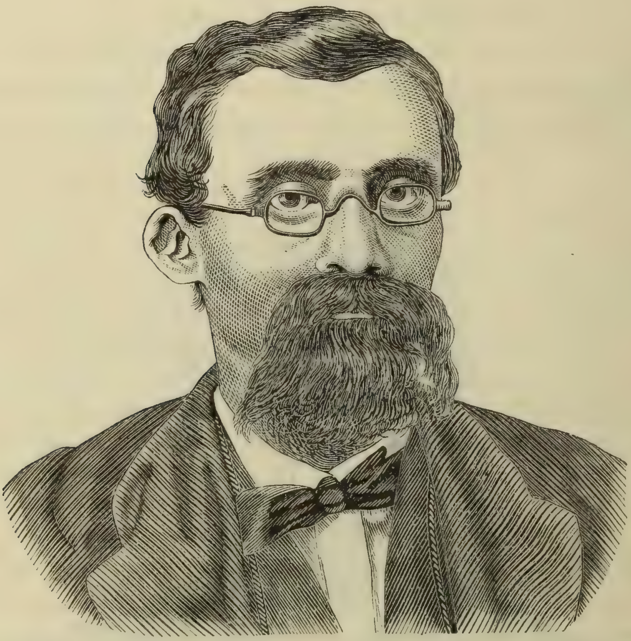


portion of alveolar process of superior maxilla, from the right to the last two molar teeth on left. He received also other injury at same time.

On or about the following dates, Feb. 11th, Feb. 27th, and April 1st, all in 1864, three surgical operations were performed by or under the direction of Wm. Otterson, M.D., then a brigade surgeon having in charge the hospitals at Nashville, the object being to restore the parts lost; but the first was a failure because erysipelas set in, the others on account of sloughing and muscular tension. It was then acknowledged that surgery could not be used to better the condition of the patient, and he was left as seen in Fig. 1.

In September, 1864, I constructed the artificial appliance which is shown in Fig. 2, in the following manner. I first took an impression of the upper part of the mouth, extending it up as far as possible in front, and from this I secured a model upon which I formed a structure to take the place of the destroyed hard parts and to act as a base for the teeth. This accomplished, I laid the patient on his back, and having closed the nasal orifices with cotton, I took—using very soft plaster—an accurate impression of all the parts which the nose and lip were to rest upon, and procuring a model from this, I built upon it plaster, from which I carved the form of a nose and lip; this I used to

Fig. 2.



vulcanize a nose and lip upon, which are in one piece, covering the lip with an artificial moustache which extends so as to hide the joint of the artificial lip with the adjacent parts, and securing the piece up and back at the top with a pair of spectacles, and back at the lower part of the nose to the artificial denture, with a gum ligature. The appliance was complete, and has been worn continually since.

CLINICAL REPORTS.

UNIVERSITY OF PENNSYLVANIA.

SERVICE OF JAMES E. GARRETSON, M.D.,

LECTURER ON SURGICAL DISEASES OF THE MOUTH.

REPORTED BY DE FOREST WILLARD, M.D.

(Continued from page 366.)

THUS, gentlemen, I have described to you the several constitutional disturbances as met with in practice; but yet these are not all the fevers coming under the notice of the surgeon. The inflammatory, the typhoid, and the hectic fevers are connected, in the majority of surgical cases, with grave local lesions of structure, not less different in their natures than the fevers themselves, though all partaking, more or less, of the inflammatory character. Thus, in inflammatory fever, the surgeon looks for a local morbid action of the simplest and purest inflammatory kind. In the typhoid he suspects some cause whereby the system is extensively vitiated, and usually finds it in some putrescence,—a poisoning of the fluids in contact with the inflamed part,—or in some less-definable contagious, epidemic, or endemic cause of disease.

In hectic, again, it is seldom he fails to observe some chronic organichange, or some exhausting suppurative discharge, lying at the foundation of the evil. In many cases, however, neither the local lesions nor the fevers accompanying them can be said to present such definite characters as I have described. Intermediate forms are by no means rare, and it is not uncommon to find a fever, which has begun in a purely inflammatory form, degenerate into hectic or typhoid,—the local lesion undergoing collateral and corresponding changes.

Thus, if a local inflammation assumes a gangrenous character, the constitutional affection invariably becomes more or less typhoid; and if, on the contrary, profuse and exhausting discharge be established for some time in a part originally only simply inflamed, the fever, with an equal certainty, merges to the hectic form.

Not unfrequently, from causes such as I have here indicated, the inflammatory or typhoid fever may have a marked, though irregularly remittent form, indicative of the presence of a cause of hectic symptoms, or the hectic may, in turn, present the nervous phenomena of the typhoid form.

But apart from these conditions, there are frequently witnessed, in surgery, fevers of an irregular character from their outset to their termination, and accompanied by lesions either not inflammatory or so different from the ordinary forms of inflammation as to require a different description, and to imply very different methods of cure. Such fevers have, commonly, a more or less remittent character; but the paroxysms have not the regular recurrence of those of hectic, nor are they accompanied by the profuse sweats which characterize that affection. The febrile condition may present strong reaction, and, in all its phenomena, approach the inflammatory type; or it may be accompanied by symptoms of unusual exhaustion and debility,—the pulse being small and weak. On the other hand, the nervous phenomena of typhoid fever may be absent, as they are in the majority of cases; or we may have slight paroxysmal delirium, or furious excitement, even verging into coma,—the former being usually observed in persons of an hysterical or excitable disposition; the latter in persons whose nervous systems have lost both activity and power by irregular habits and the use of alcoholic drinks. Finally, the fever may be of a protean character, shifting about from one to another of these types under the influence of casual excitement, or of the exacerbations and remissions of the local affection, or influenced by remediable agents, which, in these circumstances, are found to be peculiarly difficult of right application, and peculiarly treacherous in their results.

To such fevers, as a class, when occurring in surgical practice, the name is given of irritative fever.

The treatment of these fevers that we have considered properly comes within the province of the consideration of the various special lesions with which in practice we find them associated, but the vast importance of the subject, its almost constant association with surgical diseases, makes it of such a nature as to assure us that too close a consideration cannot be given it. The general principle then associated with, and applicable to, the treatment of all such affections, we may profitably spend a few moments in considering.

In the management of fevers, the first object of the practitioner should be to remove, if possible, the exciting cause. When this is of a local nature, as in many surgical fevers depending on inflammation, it may frequently be removed or kept in subjection by appropriate remedies, and then disappearance of the constitutional affection may be counted on as certain. In the early stage of acute inflammatory fever, which does not generally in itself involve the constitution in hazardous consequences as any of the other types already considered, this removal or moderation of the exciting cause is usually the main indication of treatment. Subdue the inflammation by local general means, and the fever, which is the consequence of it, will cease of itself. The treatment, therefore, of such a fever is an integral part of the treatment of inflammation.

But in some of the obstinate forms of the inflammatory, and also more commonly in the hectic and typhoid fevers, the cause may be beyond our reach. In the latter, indeed, it is often to be found in some vitiation of the whole system, prior, it may be, both to the fever and to the local affection which accompanies it. In such cases, the fever must be dealt with, not as a symptom, but as an independent and distinctive disease, the local disorders having become indeed quite of secondary importance. It is evident that under these circumstances the surgeon will have to look mainly to constitutional remedies and regimen, not disregarding any dangerous severity of local affection, but at the same time not allowing it to obscure his view or mar his plans of general management.

In following out this course, two indications must be chiefly regarded. In the first place, it is necessary to watch narrowly the type of the fever, with a view to discovering its probable course and tendency, and with a view also of anticipating its casualties by a proper general treatment and regimen. In the second place it is desirable to avert or lessen individual distressing symptoms as they occur, both for the sake of the patient's comfort and for moderation of the disease. It is to be recollected that to a very great extent the treatment of all fevers is merely palliative, and that it must always be so when removal of the exciting cause is not within our power.

In fulfilling the first and important indication, the judicious practitioner will give all his attention to the discovery and removal of such tendencies as render the fever dangerous to life, and with such view he will carefully mark the general character of the symptoms and type of the fever. If these be of a highly inflammatory kind he will not expect immediate danger, but will narrowly watch the gradual approach of symptoms of exhaustion or the slightest tendency towards the hectic, typhoid, or irritative forms of change.

If the original type be typhoid, he will be particularly solicitous about the state of the nervous functions, and will likewise observe with anxiety the strength of the circulation, knowing that danger arises on the one hand from delirium advancing to coma, and on the other from prostration so rapid as to leave no time for the exhibition of remedies. Again, if hectic be the prominent form, he will endeavor to subdue the reaction and the immoderate sweats, at the same time supporting the strength against the gradual exhaustion and emaciation which is the inevitable result of a drain upon the system. And lastly, in the irritative fever he will attempt to subdue pain and procure sleep, at the same time fulfilling such other indications as present themselves, watching the effect of remedies with care, lest the type of the affection change, and lest that which was remediably useful becomes powerless or even injurious.

In the use of individual palliative remedies, he will take care to apply them only to such symptoms as cause much present distress or create serious apprehensions for the future, and only in such measure as may harmonize or at least not interfere with the general plan of treatment. He will avoid with especial care that meddlesome and routine practice which medicates every isolated and perhaps transitory symptom by remedies altered from hour to hour without regard to those great indications which ought to form a consistent basis for all minor arrangements.

In symptoms he will regard rather the tendencies which they indicate and the types of disease they represent than their own individual signification, and will direct the remedies accordingly, applying them, if possible, so as to accomplish at once a general and a special object. At the same time, he will not fail to employ such simple means as the feelings of the patient and his own knowledge induce him to consider effective for affording relief from present discomfort, remembering, however, that there is always more danger from too much than from too little active interference of this kind.

The treatment of individual fevers on the principles here laid down will be adverted to as we progress in our clinics. But there is perhaps no part of medical practice which requires so much the teachings of experience as does the recognition of the different varieties of fevers, the detection of formidable and favorable symptoms at their earliest appearance, and the judicious application of remedies. Daily and hourly changes in many cases require the most careful watching on the part of the practitioner; and even the most skillful will at times be foiled in the discovery of some sign of importance until it has made alarming progress. The following practical rules, however, may be of some use to you, as they will generally be found applicable to every form and type of fever.

1st. Mere acceleration of the pulse is not necessarily an unfavorable sign, especially in fevers of the inflammatory kind, and united with strong reaction. But when, in fevers of the typhoid form, the pulse rises towards or beyond one hundred and twenty, more especially if it be at the same time weak or small, and with fever or the other signs of reaction, there is usually great danger of prostration before the end of the attack.

Generally speaking, a strong reaction at the beginning of a fever is indicative of a vigorous state of the constitution, and is to be regarded as favorable. Cold effusions or cold sponging of the surface may often be employed with relief to the sensations of the patient, but further active interference with reaction is seldom beneficial, except in cases of marked inflammatory complications, when the antiphlogistic regimen and treatment are required.

2d. The prostration of the nutritive and assimilating functions is not usually a source of danger in fevers of short duration. But in all protracted continued fevers, if lasting say beyond a couple of weeks, the danger from this cause becomes considerable, and fevers so protracted almost invariably tend to the typhoid form or some other type indicating exhaustion. Hence it is of much importance to convey into the system from the beginning such small quantities of the most digestible and least stimulating aliment as the weakened assimilating powers will bear, and care should be taken at the same time, by the occasional exhibition of slight aperients or purgatives, that the intestines are not unduly loaded. When the fever is protracted beyond a week without signs of amendment, it often becomes necessary to resort to the continuous exhibition of wine or alcoholic liquors, which, under such circumstances, appear to act not as ordinary stimulants, but rather as easily absorbed alimentary substance. The necessity for such remedies is judged of by the state of the pulse, by the emaciation and exhaustion, and especially by the amount of animal heat, a marked decline in which, without a crisis, is always a very unfavorable sign.

3d. The state of the secretions is an important guide to the exhibition of remedies. In this respect the cutaneous transpiration and the urine require to be particularly noticed. The phenomena of the critical evacuation as observed in these secretions has already been noticed. But all sweating in fever is not critical, and when this symptom occurs in a protracted case without a crisis, it must be looked upon as most unfavorable, leading to extreme prostration and requiring the exhibition of stimulants. In hectic and other remittent fevers, sweating may become a source of danger by frequent and sustained recurrence. It is usually mitigated by tonics, and particularly by dilute sulphuric acid and quinine in considerable doses.

Extreme diminution of the urine or scantiness of its animal constituents is always dangerous, being generally followed by typhoid phenomena. It is important, therefore, to keep this secretion tolerably abundant, and also not to allow it to accumulate too long in the bladder, as sometimes takes place in typhoid fever; in such cases it should be drawn off as often as may be necessary, by means of the catheter.

4th. The phenomena of collapse, with loss of animal heat and small weak pulse,—possibly frequent and intermitting,—are always to be regarded as formidable. They are met by the administration of alcohol and of other stimulants, especially those of the diffusible kind, as carbonate of ammonia and camphor in frequently repeated doses, while occasionally the application of artificial heat to the surface will be found useful.

5th. The nervous system requires close attention in all fevers, but particularly in the typhoid; it is commonly not until the second week of the disorder that symptoms of this class assume a dangerous character, but at this time also they have in general become a little amenable to control, and, accordingly, it is of the highest importance that the earlier premonitory symptoms should be unremittingly watched in order that they may be counteracted while yet remedies are of avail. Among these signs, none are more important than wakefulness. Unless a certain amount of truly refreshing sleep is obtained, the tone of the nervous system becomes soon undermined. Delirium sets in, at first in the slight form of wandering fancies and incoherencies of expression, but afterwards either furious or maniacal, or low and muttering with complete prostration of intellect, and this again is succeeded by stupor and death, as before described. To avert this formidable train of symptoms, the surgeon cannot be too much on the alert. He will daily inquire minutely as to the previous night; he will observe if the eye be clear, the answer intelligent and quick, the mind free from fancies; and if these indications of a sound working brain be not present, he will rightly judge that interference is required to obtain repose for the mind and consequent restoration to its normal state, or if there be much headache with flushed face, if the senses be excessively acute, the slightest noise or light producing great disturbance, and all external impressions apparently heightened, in this case also there is need of rest, lest the brain be rapidly exhausted, and lest delirium, followed by coma, supervene.

The simplest means for counteracting disorder of the cerebral functions in the earlier stages of fever, are the application of cold to the head by means of evaporating lotions, the hair having been previously removed, the abstraction of all external stimuli, especially those of light and noise, and the employment of such means of general sedation and refrigeration as are found in iced lemonade, the mistura neutralis, or the bromide of potassium. When, however, these means fail, it will be proper to administer a full dose of opium,—a remedy which may be given at an early period with tolerable freedom, but which later requires the utmost caution. If headache and flushed countenance, with other symptoms of excitement, be predominant, a few leeches may be applied to the temples, and hyoscyamus may be given either in conjunction with opium or alone, or the opium may be combined with small doses of tartar emetic, which seems in such cases to have a valuable soothing property, at the same time reducing the circulation.

If, notwithstanding these remedies, delirium supervene and show a tendency to pass into coma, the secretion of urine should be carefully looked to, and the bowels kept free by the administration of diuretics and cathartics. Stimulating enemata are also useful. Narcotics must of course be suspended, and blisters may be applied to the vertex and to other parts of the body with a view of arousing excitement. In this last stage of the disease, however, all remedies are very commonly productive of but little benefit, and our main trust has to be placed on nature's power of endurance, aided by the continuance of the stimuli.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK STATE DENTAL SOCIETY.

At the annual meeting of the Dental Society of the State of New York, held in the Assembly Chamber of the State House, at Albany, commencing June 25th, 1873, the following report was ordered to be spread at length upon the minutes, and a copy forwarded to the Dental Cosmos for publication:

Report.

Your committee, to whom was referred the subject of a proper acknowledgment on the part of the dentists of the State of New York to Dr. S. S. White, beg leave to report as follows:

Whereas, Dr. S. S. White, by his persistent efforts and indomitable energy, has succeeded not only in collecting such a mass of testimony as seems to promise to the dental profession relief from the oppressive exactions of the Goodyear Vulcanite Company, but has actually obtained the dismissal of a collusive appeal to the United States Supreme Court; and

Whereas, He has championed us in the hour of depression, and infused new hopes into our hearts; therefore

Resolved, That the grateful thanks of the Dental Society of the State of New York be tendered to Dr. S. S. White, and that we hereby express our unqualified confidence in his integrity, and in his ability to conduct to a successful issue any litigation which he may undertake in our behalf.

Signed, W. C. Barrett,
A. H. Brockway,
S. A. Freeman,
Committee.

* * *

MERRIMACK VALLEY DENTAL ASSOCIATION.

The Merrimack Valley Dental Association, numbering about ninety members, held their ninth semi-annual session at Nashua, May 1st.

The officers of the association are:

President.—Dr. L. D. Shepard, of Boston.

Vice-Presidents.—Drs. A. Severance and D. B. Ingalls.

Recording Secretary.—Dr. A. M. Dudley.

Corresponding Secretary.—Dr. E. G. Cummings.

Treasurer.—H. Hill.

Librarian.—Dr. J. H. Kidder.

The following resolution was adopted by the association:

Resolved, That the thanks of this association are due to Dr. Samuel S. White, of Philadelphia, for his untiring and gratuitous efforts in behalf of the dental profession in successfully resisting the *illegal* action of the Goodyear Dental Vulcanite Company, in "the Gardner case."

A committee was appointed to draw up articles of association, to be called the Merrimack Valley Protective Dental Association. Its object is to resist the Cummings rubber patent.

The subject of "Mechanical Dentistry" was discussed.

Dr. J. H. Kidder, of Lawrence, Mass., read an essay on the subject of "Amalgam and Amalgam Fillings."

Prof. L. D. Shepard, of Boston, delivered an essay upon the "Treatment of the First Permanent Molars."

Dr. A. M. Dudley, of Peabody, Mass., explained the method of using Dr. Fisk's saliva ejector, operated by hydraulic pressure.

Prof. Shepard explained the action of "Mack's Screws" as an adjunct in filling teeth.

Dr. J. Hemmenway explained his method of using gold wire for the same purpose.

Dr. J. H. Kidder, of Lawrence, Mass., explained the use of the rubber dam as held by steel clamps.

Clinics were held, various practical topics were discussed, and the convention adjourned to meet at Clinton, Mass., November 1st.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

THE annual meeting of the society was held May 7th.

The following officers were elected for the ensuing year:

President.—Dr. Thos. C. Stellwagen.

First Vice-President.—Dr. Louis Jack.

Second Vice-President.—Dr. J. L. Eisenbrey.

Corresponding Secretary.—Dr. J. H. McQuillen.

Recording Secretary.—Dr. E. L. Hewitt.

Treasurer.—Dr. W. H. Truman.

Librarian.—Dr. E. H. Neall.

Curator.—Dr. J. N. Wunderlich.

Executive Committee.—Drs. Louis Jack, J. H. McQuillen, C. A. Kingsbury.

A resolution was introduced and carried unanimously, that no patentee, or owner of a patent or secret remedy, should occupy the attention of the society at any of its meetings.

ALONZO BOICE, *Secretary.*

EDITORIAL.

DEFERRED MATTER.

Editorials, communications, reports, periscope, and other matter, in type and intended for this number, have been unavoidably crowded out, in consequence of the amount of space occupied by the report of the "Rubber Case."

THE RUBBER QUESTION.

In order to show the present state of the litigation under the Cummings Patent, we have procured and give below the bill, answer, and replication in one of the several suits now pending in this district.

We have selected a case begun since the decision of the Supreme Court dismissing the Gardner Appeal, in order to show what issues remain open in consequence of that decision.

SAMUEL S. WHITE.

United States Circuit Court.

EASTERN DISTRICT OF PENNSYLVANIA.

IN EQUITY.

To the Honorable the Justices of the Circuit Court of the United States for the Third Circuit, within and for the Eastern District of Pennsylvania, sitting in Equity.

The Goodyear Dental Vulcanite Company, a corporation established by law of the State of New York, and Josiah Bacon of Boston, Massachusetts, and a citizen of the State of Massachusetts, bring this their bill against William H. Gates, of the City and County of Philadelphia, dentist, and a citizen of the State of Pennsylvania.

And, thereupon, your orators complain and say, that heretofore, to wit, before the seventh day of June, in the year eighteen hundred and sixty-four, one John A. Cummings, who was then a citizen of the United States, being the original and first inventor of a certain new and useful improvement in artificial gums and palates, not at that time in public use, nor on sale with his consent or allowance for more than two years, made application in due form of law to the government of the United States for its letters-patent for such improvement; upon which application such proceedings were had that, on the said seventh day of June, letters-patent of the United States, dated the said seventh day of June, signed by the Secretary of the Interior, and countersigned and sealed with the seal of the Patent Office, by the Commissioner of Patents, were issued and delivered to the said Cummings, for the said invention, entitled an "Improvement in artificial gums and palates," whereby there was granted to the said Cummings, his heirs, administrators, or assigns, for the term of seventeen years from the said date thereof, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, as in and by a certified copy of the said letters-patent now in court produced, and shown to your honors, will more fully appear.

And your orators further show unto your honors, that afterward, to wit, on the thirteenth day of July, A.D. 1864, by certain deeds of assignment duly executed and recorded in the United States Patent Office, all right, title, and interest in the said letters-patent, and the invention and improvement secured thereby, became vested in the Dental Vulcanite Company, a corporation established by law of Massachusetts, as by the said deeds of assignment, or certified copies thereof, with the endorsements of the recording thereon, now produced and shown to your honors, will more fully appear.

And your orators further show unto your honors, that the said Dental Vulcanite Company, after such assignment to them, surrendered their aforesaid patent, according to law, on account of a defective specification; and a new patent was duly issued to them on the tenth day of January, 1865, for the same invention, in accordance with their corrected description and specification, whereby was granted and secured to the said Dental Vulcanite Company and their successors and assigns, for the full term of seventeen years from the said seventh day of June, 1864, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvements therein described and claimed, and hard rubber-plates embracing the same, as in and by said reissued letters-patent, or a certified copy thereof, here in court to be produced, will more fully appear.

And your orators further show unto your honors, that afterward, to wit, on the twenty-first day of March, 1865, these last named letters-patent were, according to law, surrendered by the said Dental Vulcanite Company, and canceled on account of defects still discovered in the specification, and a new patent was duly issued, bearing said last-named date, in accordance with their corrected description and specification, and for the same improvements, whereby was granted and secured to the said Dental Vulcanite Company and their successors and assigns, for the full term of seventeen years from the said seventh day of June, 1864, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvements therein specified and claimed, and hard rubber-plates embracing the same, as in and by said second reissued patent, or a certified copy thereof, here in court to be produced, will more fully appear.

And your orators further show, that on the seventeenth day of July, A.D. 1866, the said Dental Vulcanite Company, by a certain deed of assignment of that date, here in court to be produced, did sell and assign to your orator, Josiah Bacon, of Boston, Massachusetts, the said letters-patent and all the rights thereby vested, together with the right to sue for and collect to his own use all damages for past infringements thereon, and that said assignment was made in trust for certain persons then associated together with intent to form the corporation which is your orator in this bill, and in contemplation of the formation of such corporation, and that such associates did afterward form and are now members of such corporation.

And your orators further show unto your honors, that your orator, the said Bacon, on or about the seventh day of January, 1868, by his deed of that date, here in court to be produced, in pursuance of said trust assigned to your orators, the said Goodyear Dental Vulcanite Company, the said letters-patent, and all rights and privileges under the same, and also the right to demand, sue for, and collect to their own use, all damages at law and profits in equity for past infringements of said letters-patent; but your orators, the said Goodyear Dental Vulcanite Company, submit that they are entitled in equity to recover such profits by reason of the said Bacon's holding of said patent having been in trust as aforesaid, as well as because they are assignees of all said Bacon's right to recover such profits.

And your orators further show unto your honors, that the said Cummings, his mesne assignees, and your orators have always, since the grant of the said letters-patent, and during the time they each owned the same respectively, and in the exercise of the full and exclusive right and liberty so granted as aforesaid, made, used, and vended to others to be used, the said improvement so patented, and have had and maintained, until the infringement hereafter complained of, exclusive possession of the said improvement and invention, under and by virtue of said letters-patent, and have never acquiesced in any invasion or infringement of their said rights.

And your orators further show unto your honors, that since the date of the said letters-patent, more than five thousand dentists, within the limits of the United States, have submitted to the claims of your orators and their assignors under said letters-patent, and have taken licenses to use the said improvement under the same.

And your orators further show unto your honors, that said Dental Vulcanite Company filed their bill of complaint against one Isaac J. Wetherbee on the twenty-fifth day of October, 1864, in the Circuit Court for the District of Massachusetts, praying for an injunction and other relief in equity against said Wetherbee, for infringement of said patent, to which bill of complaint the said Wetherbee filed his answer, denying the validity of said letters-patent, and alleging, among other defenses, that said Cummings was not the original and first inventor thereof, and setting up that many other persons, both in Europe and in the United States, used and practiced said invention before said Cummings's alleged invention. Whereupon such proceedings were had, that evidence was taken by both parties upon all the points at issue, and the case was fully heard and argued before the said Circuit Court, and thereupon, to wit, at the May term, 1866, of said Circuit Court, said court rendered its decision upon all the points at issue, and ordered judgment and a final decree in favor of the complainants, and a perpetual injunction to be issued against said Wetherbee, enjoining him from infringing upon said letters-patent.

And your orators further show unto your honors, that in the latter part of 1866, a large number of dentists combined together to resist said patent in the district of Maryland, and test cases were made on bills filed on November 23, 1866, in the United States Circuit Court for said district, by Josiah Bacon *vs.* Hugh Arthur and Robert Arthur, and by Josiah Bacon *vs.* Adalbert Volck, and a full hearing was had on motions for interlocutory injunctions, on which the validity of said patent was fully and exhaustively argued by counsel for the respective parties, and on the 10th day of December, 1866, the court, Giles, J., rendered an opinion in favor of complainants, and decided to grant the injunctions. And thereupon such proceedings were had that decrees were made in favor of complainants in both of said suits, and said injunctions were made perpetual.

And your orators further show unto your honors, that on the 14th day of April, 1868, a bill was filed in the United States Circuit Court for the Western District of Pennsylvania, by the complainants in this cause against Charles Sill and Milton E. Gillespie, for infringement of said letters-patent; and, after full argument by counsel for the respective parties, on a motion for an interlocutory injunction in said suit, the said court, McCandless, J., entered a decision in favor of complainants, and granted the said injunctions, on the 18th day of May, 1868. And thereupon such proceedings were had that on the 13th day of November, 1868, a decree in favor of the complainants was made in said suit, and said injunction was made perpetual.

And your orators further show unto your honors, that one Benoni E. Gardner, a citizen of the State of Rhode Island, infringed upon said patent, whereupon your orators filed their bill of complaint against said Gardner on the 16th day of September, 1868, in the United States Circuit Court for the District of Rhode Island, praying for an injunction and other relief in equity against said Gardner; to which said bill of complaint said Gardner filed his answer, denying the validity of said letters-patent, and alleging, among other defenses, that said Cummings was not the original and first inventor of said improvement, and setting up that many other persons had used and practiced the said improvement before the invention thereof by said Cummings, as claimed and set forth in said bill of complaint. And thereupon evidence was fully and exhaustively taken by both parties upon all the points at issue, and the cause was brought to a final hearing on its merits, and fully argued before said court, before Hon. Nathan Clifford, Judge, and thereupon at the June term, 1870, the judgment of said court was pronounced in favor of the complainants on all the points at issue, and a decree was entered, directing among other things, that a perpetual injunction be issued against said Gardner, enjoining him from infringing upon said letters-patent. And thereupon the said Benoni E. Gardner appealed from said decree to the Supreme Court of the United States, and the said Supreme Court, after full argument by counsel for both parties, rendered its decision, affirming said decree, on the 6th day of May, 1872.

And your orators further show unto your honors, that the *respondent* herein, having full knowledge of the premises, and in violation of your orators' exclusive right and privilege as aforesaid, and utterly disregarding the same, *has*, since the 17th day of July, 1866, and before and since the said assignment of the said letters-patent to your orators, the Goodyear Dental Vulcanite Company, without the license of your orators, at Philadelphia, Pennsylvania, and at various other places in the United States, manufactured, used, and sold, and still *continues* to manufacture, use, and sell, many artificial gums and palates, embracing the improvement and invention described in said letters-patent, and so secured to your orators —how many, your orators are unable to say, but pray that the *respondent* may discover and set forth in *his* answer to this bill.

And your orators further show unto your honors, that they will be subject to great and irreparable injury, unless they shall obtain from your honors the relief hereby sought.

To the end, therefore, that the said *defendant* may, if *he* can, show why your orators should not have the relief hereby prayed, and may upon .... *oath* .... and according to the best and utmost of *his* ....

..............................knowledge, remembrance, and belief, full, true, direct, and perfect answer make to all and singular the matters hereinbefore stated and charged, as fully and particularly as if the same were hereinafter repeated, and *he*.................................. thereunto distinctly interrogated, and more especially that *he*..may answer and set forth,—

1. Whether *he has* not made, or caused to be made, or used, or sold, dental plates made wholly or partly of hard rubber or vulcanite, since the 17th day of July, 1866, and what number thereof, according to the best of *his* knowledge, information, and belief, as near as *he* can approximate the same?

2. Whether *he has* not made, or caused to be made, or used, or sold, dental plates made wholly or partly of hard rubber or vulcanite, since the first day of January last, and what number thereof, according to the best of *his* knowledge, information, and belief, as near as *he* can approximate the same?

3. Whether *he has* not made, or caused to be made, or used, or sold, dental plates made wholly or partly of hard rubber or vulcanite, since the 17th day of July, 1866, in each of the successive years ending on the 31st days of December thereof respectively, specifying separately each of the said years in which any of said dental plates were so made, used, or sold, and what number thereof in each of said years respectively, according to the best of *his* knowledge, information, and belief, as near as *he* can approximate the same?

4. Whether *he has* not received money or property directly or indirectly from the manufacture, use, or sale, since the 17th day of July, 1866, of dental plates made wholly or partly of hard rubber or vulcanite, and what amount of such money or property *he has* received, or *is* entitled to receive from such manufacture, use, or sale, since the 17th day of July, 1866, specifying the amount received in each of the successive years ending on the 31st day of December thereof respectively, and also the amount received since the first day of January last, according to the best of *his* knowledge, information, and belief, as near as *he* can approximate the same?

5. Whether *he has* not now on hand a quantity, and how much of any substance composed wholly or partly of gum, or rubber prepared to be manufactured into plates, or gums of hard rubber, or vulcanite?

6. Whether *he has* not now on hand many, and how many dental plates, or gums made wholly or partly of hard rubber or vulcanite?

And that the said *respondent* may answer the premises, and may be decreed to account for and pay over to your orators all such gains and profits as have accrued to *him* from *his* said infringement by making and selling such artificial gums and palates, and also to pay to your orators, in addition to said profits, the damages which have been sustained by your orators by reason of said infringement, and that *he* may be restrained by an injunction issuing out of this honorable court, from making, using, or vending to others to be used, any artificial gums or palates, embracing the improvement so secured to your orators as aforesaid, and also that an injunction issue so restraining the *defendant* pending this cause, and that the said rubber or vulcanite, and the artificial gums and palates so manufactured by *him* of said rubber or vulcanite, and now in possession of said *respondent*, may be destroyed or delivered up to your orators, and for such other and further relief as the nature of the case may require, and to your honors may seem meet.

May it please your honors to grant unto your orators not only a writ of injunction conformable to the prayer of this bill, but also the writ of subpœna directed to said William H. Gates, commanding him to appear and answer to this bill of complaint, and to do and receive what to your honors shall seem meet.

And your orators will ever pray.

GOODYEAR DENTAL VULCANITE COMPANY,
By its Treasurer, Josiah Bacon.

J. E. SHAW, *Complainant's Solicitor.* } JOSIAH BACON.
GEO. HARDING, *Of Counsel.* }

UNITED STATES OF AMERICA, } *ss.*
DISTRICT OF MASSACHUSETTS. }

At Boston, in the county of Suffolk, in said District, this twenty-seventh day of February, A.D. 1873, personally appeared Josiah Bacon, who signs the foregoing bill, and made oath that he has read the same, and understands the same and the contents thereof; and that all the matters therein stated as of the knowledge of the complainants, are to his knowledge true, and as to all other matters therein stated, he verily believes them to be true.

Before me,

{ NOTARIAL SEAL. } E. ERNEST CADUC,
Notary Public.

A true copy.

SAMUEL BELL, *Clerk Circuit Court U. S.,*
Eastern District of Pennsylvania.

United States Circuit Court.

EASTERN DISTRICT OF PENNSYLVANIA.

IN EQUITY.

THE GOODYEAR DENTAL VULCANITE COMPANY AND JOSIAH BACON,
vs.
WILLIAM H. GATES.
No. 3, April Session, 1873.

The answer of William H. Gates, of Philadelphia, Pennsylvania, defendant, to the bill of complaint of the Goodyear Dental Vulcanite Company, and Josiah Bacon, complainants.

This defendant, now and at all times hereafter, saving and reserving to himself all and all manner of benefit or advantage of exception or otherwise, which can or may be had or taken to the manifold errors, uncertainties, imperfections, and insufficiencies in the said bill of complaint contained, for answer thereto, or to so much and such parts thereof as this defendant is advised it is material or necessary for him to make answer unto, answering, saith :

That he is not informed, otherwise than by the allegations in said bill of complaint, and does not know, whether the said complainant, The Goodyear Dental Vulcanite Company, is a corporation established by law of the State of New York; and that due proof thereof may be made in this cause, he denies that it is such corporation or so established as alleged in said bill of complaint.

This defendant is informed and believes, and thereupon admits, that before the seventh day of June, in the year one thousand eight hundred and sixty-four, to wit, on or about the twenty-fifth day of March, in said year one thousand eight hundred and sixty-four, one John A. Cummings, who was then a citizen of the United States, made application to the government of the United States for its letters-patent for a certain alleged new and useful improvement in artificial gums and palates, upon which application such proceedings were had, that on the seventh day of June, in said year one thousand eight hundred and sixty-four, letters-patent of the United States, numbered forty-three thousand and nine (43,009), dated the said seventh day of June, signed by the Secretary of the Interior, and countersigned by the Commissioner of Patents, and sealed with the seal of the Patent Office, were issued and delivered to the said Cummings for the said alleged improvement.

But this defendant, upon information and belief, denies that said Cummings was the original and first inventor of said alleged improvement; he denies that said alleged invention was not at the time of said Cummings's application for said letters-patent in public use and on sale; he denies that it had not been at that time in public use or on sale with his consent or allowance more than two years; and he denies that said Cummings or his assigns have any right to the exclusive use of said alleged improvement.

And this defendant further says upon information and belief, that prior to the said seventh day of June, in the year one thousand eight hundred and sixty-four, the said Cummings had by an instrument of writing, under seal, duly executed and delivered, and dated on or about the first day of March, in said year one thousand eight hundred and sixty-four, assigned, sold, set over, and conveyed unto G. H. P. Flagg and H. D. Osgood, both of Boston, Massachusetts, one undivided quarter of all his right and interest in said alleged invention, and in the said letters-patent issued upon the application therefor, as aforesaid, as, recourse being had to said instrument of writing, as recorded in the United States Patent Office, will more fully and at large appear, and as will fully appear recourse being had to a duly authenticated copy of said instrument, or to said instrument of writing itself, which this defendant is informed and believes is in the possession or under the control of this complainant Josiah Bacon, and which instrument this defendant therefore prays said Bacon may be required to produce and file in this court, to be used on any examination of witnesses in this cause, and at the hearing thereof, as this defendant may be advised. And this defendant further says upon information and belief, that prior to the said seventh day of June, in the year one thousand eight hundred and sixty-four, the said Cummings had by an instrument of writing, under seal, duly executed and delivered, and dated on or about the sixteenth day of May, in said year one thousand eight hundred and sixty-four, assigned, sold, set over, and conveyed to Joseph Gavett, of Boston, Massachusetts, one undivided eighth part of all his right or property in said alleged invention, and in the said letters-patent issued upon the application therefor, as aforesaid, as will fully appear, recourse being had to said instrument of writing, which this defendant is informed and believes has never been recorded in the United States Patent Office, but which, as he is informed and believes, has been and now is in the possession of or under the control of this complainant, Josiah Bacon, and which instrument of writing this defendant therefore prays said Bacon may be required to produce and file in this court, to be used on any examination of witnesses in this cause, and at the hearing thereof, as this defendant may be advised.

As to the alleged deeds of assignment mentioned in said bill, whereby, on the thirteenth of July, in the year one thousand eight hundred and sixty-four, the said letters-patent and the alleged invention and improvements secured thereby are alleged to have become vested in the Dental Vulcanite Company named in said bill, this defendant is not otherwise informed, and has no knowledge, and he therefore denies the allegations thereof contained in said bill, and leaves the complainants to make proof thereof as they may be advised.

And further answering, this defendant is informed and believes, and thereupon admits, that the aforesaid letters-patent numbered forty-three thousand and nine (43,009) were on or about the twenty-first day of December in said year, one thousand eight hundred and sixty-four, surrendered and canceled, and a new patent numbered (reissue) one thousand eight hundred and forty-eight (1848) issued on the tenth day of January, in the year one thousand eight hundred and sixty-five, to the Dental Vulcanite Company; but this defendant upon information and belief denies all and singular the other allegations in said bill contained, respecting the surrender of said original letters-patent and the reissue thereof, under date of January tenth, A.D. 1865.

And further answering, this defendant is informed and believes, and thereupon admits, that after said tenth day of January, in the year one thousand eight hundred and sixty-five,—to wit, on or about the twenty-seventh day of February, in the year one thousand eight hundred and sixty-five,—the aforesaid reissued letters-patent numbered one thousand eight hundred and forty-eight were surrendered and canceled, and he so as aforesaid admits that a new patent was thereupon issued to the Dental Vulcanite Company, bearing date the twenty-first day of March, in said year one thousand eight hundred and sixty-five, which new patent is numbered (reissue) one thousand nine hundred and four; but he so as aforesaid denies that said last-mentioned reissue was for the same alleged improvement, and he further denies that thereby was secured to said Dental Vulcanite Company, their successors and assigns, the exclusive right and liberty of making, constructing, using, and vending to others to be used, the alleged improvements therein specified and claimed, and hard rubber plates embracing the same.

And further answering, this defendant says that he is not informed otherwise than by the allegations in said bill of complaint, and does not know whether the said Dental Vulcanite Company did on the seventeenth day of July, A.D. 1866, by a deed of assignment of that date, sell and assign to this complainant, Josiah Bacon, in trust for others, the said letters-patent and all the rights thereby vested, together with the right to sue for and collect to his own use all damages for past infringements thereon; and therefore, and in order that due proof may be made in that behalf as the complainants may be advised, this defendant denies each and every of the allegations in said bill contained respecting such alleged assignment.

And further answering, this defendant says that he is not informed otherwise than by the allegations in said bill of complaint, and does not know whether the said Bacon, on or about the seventh day of January, 1868, by his deed of that date, assigned to this complainant, the Goodyear Dental Vulcanite Company, the said letters-patent and all rights and privileges under the same, and also the right to sue for and collect to their own use all damages at law and profits in equity for past infringements of said letters-patent; and therefore, and in order that due proof may be made in that behalf as the complainants may be advised, this defendant denies each and every of the allegations in said bill contained respecting such alleged assignment.

And this defendant denies, upon information and advice, that said complainant, the Goodyear Dental Vulcanite Company, are entitled in equity to recover profits, as alleged in the said bill of complaint, by reason of said Bacon's alleged holding of said patent having been in trust, as alleged in said bill, as well as because they are alleged assignees of all said Bacon's alleged right to recover such profits.

And further answering, this defendant, upon information and belief, denies that the said Cummings, his mesne assignees, and these complainants, have always, since the grant of said letters-patent and during the time they each owned the same respectively, and in the exercise of the alleged right and liberty so granted as aforesaid, made, used, and vended to others to be used, the said alleged improvement so patented as aforesaid; or have had and maintained, until the infringement complained of in said bill, exclusive possession of said alleged improvement and invention under and by virtue of said letters-patent; and he so as aforesaid further denies that they have never acquiesced in any invasion or infringement of their said alleged rights.

And further answering upon information and belief, this defendant further denies that since the date of the said letters-patent, more than five thousand dentists within the limits of the United States have submitted to the claims of these complainants and their assignors under said letters-patent, and have taken licenses to use the said alleged improvement.

And this defendant, further answering, says that he is informed and believes, and thereupon admits, that on or about the twenty-fifth day of October, A.D. 1864, the said Dental Vulcanite Company filed their bill of complaint against one Isaac J. Wetherbee in the United States Circuit Court for the District of Massachusetts, praying for an injunction and other relief in equity against said Wetherbee for alleged infringement of said original letters-patent numbered forty-three thousand and nine, and dated June 7, A.D. 1864, as aforesaid; that the said Wetherbee filed his answer to said bill of complaint, denying the validity of said letters-patent, and alleging, among other defenses, that said Cummings was not the original and first inventor of the improvement patented to him in said original letters patent No. 43,009, and setting up that many other persons, both in Europe and in the United States, used and practiced said invention before said Cummings's alleged invention.

And this defendant, further answering upon information and belief, says that upon the filing of said answer to said bill by said Wetherbee, or very soon thereafter, the said letters-patent were surrendered and canceled and reissued under date of January 10, 1865, and this reissue again was thereafter surrendered and canceled and reissued under date of March 21, A.D. 1865, as hereinbefore set forth. That after said several reissues of said letters-patent, said cause was proceeded in between said Dental Vulcanite Company and said Wetherbee, but the pleadings therein on the part of said Wetherbee were in the final decision of said suit adjudged irregular; and under such adjudication many of the defenses set up by said Wetherbee were excluded from consideration by said court; others of the defenses set up by said Wetherbee were avoided by the reissue of said letters patent after said Wetherbee had filed his answer to said bill of complaint; others of said Wetherbee's defenses in said suit were not supplemented by proof, but were waived or abandoned, and the only points at issue on the final hearing of said cause did not involve the defenses hereinafter made by this defendant, nor include the proofs upon which this defendant relies; and the decree alleged in the bill of complaint as rendered in said suit was not based upon correct conclusions of law or fact, and is therefore not in anywise conclusive as to the validity of the said reissued letters-patent set out in the bill of complaint in this cause, nor as to the rights of the complainants alleged therein.

And further answering, this defendant says that respecting the alleged proceedings in the United States Circuit Court for the District of Maryland by Josiah Bacon against Hugh Arthur and Robert Arthur and against Adalbert Volck, and respecting the alleged proceedings in the United States Circuit Court for the Western District of Pennsylvania against Sill and Gillespie, mentioned in said bill of complaint, this defendant has no knowledge or information other than is afforded by the said bill of complaint itself, save that he is informed and believes that all of said proceedings were taken and had under or in connection with the letters-patent granted to Nelson Goodyear, May 6, 1851, as reissued in 1858, and said suits were not, nor was any or either of them, brought to final hearing, nor any proofs taken therein after the interlocutory injunctions were granted, as alleged in said bill of complaint; and he is further informed and believes that said suits were not contested suits, and did not raise any inquiry into the validity of the letters-patent set out in the bill of complaint in this cause, and that said suits were compromised, or the defenses thereof abandoned, in view of their connection with the aforesaid letters-patent of Nelson Goodyear; and this defendant is advised and believes, and thereupon avers, that said proceedings are not in anywise conclusive as to the validity of the said reissued letters-patent set out in the bill of complaint in this cause, nor as to the rights of the complainants alleged therein.

And further answering, this defendant says that respecting the proceedings in the United States Circuit Court for the District of Rhode Island, by these complainants, The Goodyear Dental Vulcanite Company and Josiah Bacon, against Benoni E. Gardner, as alleged in said bill of complaint, and respecting the appeal taken from the decree of said Circuit Court to the Supreme Court of the United States, and the affirmance of said decree by said Supreme Court on the 6th day of May, 1872, he is informed and believes and thereupon avers that said proceedings in said suit in the Circuit Court of Rhode Island, and in the said Supreme Court of the United States, were collusive, fraudulent, and false; that there was no dispute between said complainants and said Gardner, in said Circuit Court nor in said Supreme Court; that the decree in said Circuit Court was not and was not intended to be enforced, but that before and at the date of such decree said Gardner was protected against the same by agreements made in that behalf between these complainants and one J. B. Newbrough; that the injunction awarded against said Gardner was not and was not intended to be enforced; that the costs in said suit and on said appeal were paid by these complainants; that both sides of said cause were argued, at the fraudulent and collusive hearing thereof before Mr. Justice Clifford, by counsel who were paid for such arguments by these complainants; that these complainants paid counsel on both sides for preparing the record in said cause and for arguing the same on the appeal before said Supreme Court, and that both in said Circuit Court and in said Supreme Court these complainants controlled the preparation and argument of the said cause so as to make the same collusive in both courts; that upon due proceedings had in that behalf these facts were laid before the said Supreme Court of the United States, at the adjourned term in October, 1872, and that in their answer, filed in the course of these proceedings, these complainants admitted that in said suit they had paid the counsel employed for the pretended defense, as well as for themselves, in the Circuit Court, and subsequently in said Supreme Court, and thereupon the said Supreme Court of the United States did, as this defendant is informed and believes, on or about the third day of March, A.D. 1873, annul and vacate its affirmance of said decree in Rhode Island, and dismissed the said false and collusive appeal, and recalled the mandate which had been issued to said Circuit Court, by reason of the said cause having been merely collusive both in the court below and in the said Supreme Court, so that said decrees are not in anywise conclusive as to the validity of the said reissued letters-patent set out in the bill of complaint in this cause, nor as to the rights of the complainants alleged therein.

And for answer to the interrogatories in said bill contained, this defendant says, to the first of said interrogatories, that he has made, or caused to be made, and has sold dental plates made wholly or partly of hard rubber or vulcanite since the seventeenth day of July in the year one thousand eight hundred and sixty-six.

To the second of said interrogatories, this defendant, answering, says that he has made, or caused to be made, and has sold dental plates made wholly or partly of hard rubber or vulcanite since the first day of January last. To so much of said first and second interrogatories as demands the number of such plates made, or caused to be made, and sold by this defendant, and to the whole of the third and fourth of said interrogatories, this defendant respectfully suggests, by way of objection, exception, and demurrer, that these complainants are not or are not at this stage of this cause entitled to answers to said parts of said first and second interrogatories, nor to any part of said third and fourth interrogatories, for the following, among other reasons, to wit: that said parts of said first and second interrogatories, and the whole of said third and fourth interrogatories, are irrelevant and impertinent, and not founded upon any sufficient averment in said bill of complaint; that without an ascertainment and adjudication that this defendant has violated or infringed the reissued letters-patent mentioned in said bill, and until it is decreed that the said reissued letters-patent are good and valid, the complainants are not entitled to the aforesaid information demanded in said interrogatories; and that in advance of a decree for an account, the complainants are not entitled to inquire into the defendant's business, or to demand the particulars or incidents thereof.

To the fifth of said interrogatories this defendant answers No.

To the sixth of said interrogatories this defendant says that he does not keep on hand any dental plates or gums made wholly or partly of hard rubber or vulcanite, but has them made to order only, and delivers them as soon as completed, and has none now on hand.

And this defendant, still insisting upon each and all of the foregoing objections to the bill of complaint, and to the aforesaid reissued letters-patent numbered one thousand nine hundred and four, further answering says, by way of further defenses to said bill of complaint, that he is informed and believes, and upon information and belief avers—

I. That the pretended invention or improvement, or a substantial and material part thereof, or substantial and material parts thereof, described and set forth and claimed in the reissued letters-patent numbered one thousand nine hundred and four, and dated March twenty-first, in the year one thousand eight hundred and sixty-five, was or were not described nor specified nor represented nor suggested nor indicated in the specifications, drawings or model deposited in the United States Patent Office in connection with the application of said Cummings for the original letters-patent numbered forty-three thousand and nine, and dated June 7, A.D. 1864, before the issue of said original letters-patent; nor was nor were such pretended invention or improvement nor such part or parts thereof as aforesaid described or specified or represented or indicated or suggested in the specification or drawings of said original letters-patent, numbered forty-three thousand and nine, and issued June 7, 1864, but that the said pretended invention and improvement, or the said substantial and material part or parts thereof, was or were first described and set forth and claimed by the said Cummings in the new or amended and corrected description and specification annexed to the reissued letters-patent (granted and issued upon the surrender and cancellation of said original letters-patent) numbered one thousand eight hundred and forty-eight, and dated January tenth, in the year one thousand eight hundred and sixty-five, and that said pretended invention and improvement, or said substantial and material part or parts thereof, was or were again described and set forth and claimed by the said Cummings in the new or amended description and specification annexed to the reissued letters-patent (granted and issued upon the surrender and cancellation of said first mentioned reissued letters-patent No. 1848, dated January 10, 1865), numbered one thousand nine hundred and four, and dated March 21, 1865, by reason of which facts said letters-patent numbered (reissue) one thousand nine hundred and four, and dated March 21, 1865, were granted and issued contrary to law, and were and are null and void.

II. That the claim set forth by said Cummings in the new or amended and corrected description and specification annexed to the reissued letters-patent No. 1904, dated March 21, 1865, and granted as mentioned in said bill of complaint, does not cover or comprise any device or invention or improvement which is by law the proper subject of letters-patent of the United States, but that said claim is wholly invalid, void, and inoperative in law.

III. That the said John A. Cummings was not the original and first inventor or discoverer of the thing patented, or of a substantial and material part or of substantial and material parts thereof, claimed as new in said reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1865, but that long prior to the pretended invention thereof by said Cummings, the same thing, or a substantial and material part thereof, or substantial and material parts of the thing patented or claimed as new in said reissued letters-patent, was known to and used by the following-named persons, and at the following-named places, to wit:

George E. Hawes, of and at New York City.

C. O. Crosby, of and at New Haven, Connecticut.

William A. Royce, of and at Newburgh, New York.

Elias Wildman, of and at Philadelphia, Pennsylvania.

Charles Goodyear, deceased, formerly of New York City, at said New York City, and at New Haven, Connecticut, and in London, England, and Paris, France.

Charles Goodyear, Jr., of New Rochelle, New York, at New

York City, and at New Haven, Connecticut, and at London, England, and Paris, France.

Asa Hill, of and at Norwalk, Connecticut.

Emanuel G. Blackman, of and at Norwalk, Connecticut.

C. S. Putnam, deceased, at New York City.

L. E. Christopher, of and at New York City.

William A. Bevin, of and at Boston, Massachusetts.

F. A. Bevin, deceased, at New Haven, Connecticut.

G. A. Foster, of and at Utica, New York.

Henry B. Goodyear, of and at New Haven, Connecticut, and at New York City.

Willard Ball, of and at Walpole, New Hampshire.

Nelson Goodyear, deceased, of and at New York City, and at New Haven, Connecticut.

Jehial Parmly, of and at New York City.

John Lovejoy, of New York City, and if not deceased, of New York City.

Archibald McIlroy, of Greenwich, Connecticut, and at New York City.

IV. That the said John A. Cummings was not the original and first inventor or discoverer of the thing patented, or of a substantial and material part or of substantial and material parts thereof, claimed as new in said reissued letters-patent No. 1904, dated March 21, 1865, but that anterior to the supposed discovery thereof by said Cummings the thing patented, or a substantial and material part thereof, or substantial and material parts of the thing patented or claimed as new in said reissued letters-patent No. 1904, had been described in the following printed publications, to wit:

The Lancet. A Journal of British and Foreign Medical and Chemical Science, Criticism, Literature and News. MDCCCXLV. In Two Volumes Annually. Volume II. Edited by Thomas Wakley, Surgeon, M.P. for the Metropolitan District of Finsbury, and Coroner for the County of Middlesex. London: Printed for the Editor and Published by John Churchill, Princes Street, Soho. In the number of said work for September 13, 1845, pp. 284, 285, 286, 287 of said volume, and in the number of said work for September 20, 1845, pp. 310, 311, 312 of said volume.

The American Journal of Dental Science. Edited by Chapin A. Harris, M.D., D.D.S., etc. New Series, Volume I. Philadelphia, Lindsay & Blakiston; Baltimore, Armstrong & Berry; New Orleans, John Ball. 1850. Pages 3 to 12 (both inclusive) of said volume, being the number of said journal for October, 1850. Said *American Journal of Dental Science*, Volume IV., New Series, at pages 79 to 93; also at page 176; and also at pages 223–226, being respectively the numbers of said journal for October, 1853, and for January, 1854. Also in said *American Journal of Dental Science*, Volume VI., New Series, at pages 477, 478, and 479, being the number of said journal for July, 1856.

The Dental News Letter. Vol. IV., January, 1851, No. 2. Jones, White & McCurdy, Proprietors and Publishers, 120 Arch Street, Philadelphia, 263 Broadway, New York, and Branch at 23 Tremont Row, Boston; pp. 59, 60, 61, 62, and 63 of said number of said publication.

The Dental News Letter. Edited by J. D. White and J. R. McCurdy. Published Quarterly by Jones, White & McCurdy, Proprietors and Publishers, 528 Arch Street, Philadelphia, 335 Broadway, New York, and Branch at 16 Tremont Row, Boston. Volume XI., April, 1858, No. 3; pp. 170, 171, and 172 of said number of said publication. Also in said *Dental News Letter* for July, 1858 (being No. 3 of said Vol. XI.), at pages 253, 254, and 255, and on the second page of the advertisements at the back of said number of said work. Also in said *Dental News Letter* for July, 1859 (being No. 4 of Vol. XII.), at pages 289 and 290 of said number of said publication.

The Vulcanite. A Quarterly Journal, devoted to the Science of Mechanical Dentistry. Edited by B. W. Franklin, New York. Published by the American Hard Rubber Co., No. 640 Broadway. Vol. I., No. 1, May, 1860, pages 2 to 14 (both inclusive); Vol. I., No. 2, August, 1860, pages 65, 66, 67, 68, 69, and 70; also Vol. I., No. 3, November, 1860, at pages 99, 100, 101, 102, 103, 104, and 105; also pages 130 to 132; also Vol. I., No. 4, February, 1861, pages 164 to 168, and pages 178, 179, and 180; also Vol. II., No. 1, May, 1861, pages 32 to 36, pages 40 to 43; also Vol. II., No. 2, August, 1861, pages 106 to 110; also Vol. II., No. 3, November, 1861, pages 142 to 146; also Vol. II., No. 4, February, 1862, pages 176 to 181.

The Principles and Practice of Dental Surgery. By Chapin A. Harris, M.D., D.D.S., etc., etc. Philadelphia: Lindsay & Blakiston. Fifth Edition, 1853. Pages 736, 737, 738, 739, and 740.

A Dictionary of Medical Terminology, Dental Surgery, and the Collateral Sciences. By Chapin A. Harris, M.D., D.D.S., etc., etc. Second edition. Philadelphia: Lindsay & Blakiston, 1855; at pages 343 and 344, under the title "Gutta-Percha."

Great Exhibition of the Works of Industry of all Nations, 1851. *Official Descriptive and Illustrated Catalogue.* In three volumes. Vol. I., London, 1851; at p. 474. Article No. 720.

Exhibition of the Works of Industry of all Nations, 1851. *Reports of the Juries on the Subjects in the Thirty Classes into which the Exhibition was divided.* London, 1852; at p. 598.

The American Journal of Dental Science. New Series. Volume II., at page 332; being the number of said journal for January, 1852.

Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences. Publiés conformément à une Décision de l'Académie en date du 13 Juillet, 1835. Par MM. les Secrétaires Perpetuels. Tome trente-troisième, Juillet–Décembre, 1851. Paris: Bachelier, Imprimeur-Libraire de l'Ecole Polytechnique au Bureau des Longitudes, etc., Quai des Augustins, No. 55; 1851; at page 126.

The Dental Register of the West. Published Quarterly, by order of the Mississippi Valley Association of Dental Surgeons. Cincinnati: John D. Thorpe, Printer, No. 12 West Fourth St. 1850; at pp. 38, 39 and 40, being the number of said Register for October, 1850.

The New York Dental Recorder. Devoted to the Theory and Practice of Surgical, Medical and Mechanical Dentistry. Edited by C. C. Allen, M.D., Dentist. Volume IV. New York: Printed by Grossman & Son, 59 Ann St. 1850; pages 286, 287 and 288, being the number of said journal for September, 1850.

Also, that the pretended invention or improvement described and set forth and claimed in said reissued letters-patent No. 1904, or a substantial and material part thereof, or substantial and material parts thereof claimed as new, had been long prior to the alleged invention or discovery of said Cummings described in the following letters-patent and application for letters-patent of the United States, to wit: Letters-patent No. 8075, granted to Nelson Goodyear of New York city, dated May 6, 1851. Reissued letters-patent No. 556 and reissued letters-patent No. 557, granted to Henry B. Goodyear, administrator of Nelson Goodyear, deceased, each dated May 18, A.D.

1858; being reissues of said letters-patent No. 8075. Letters-patent No. 9968, granted to Charles Goodyear, of New Haven, Connecticut, assignee of Charles Goodyear and Robert Haering, dated April 12, 1853. The rejected application of Robert Haering of New York, New York, for letters-patent for a new and improved mode of inserting artificial teeth; filed in the United States Patent Office, March 25, 1856. Letters-patent No. 8621, granted to John Allen, of Cincinnati, Ohio, dated December 23, 1851. Letters-patent No. 12,156, granted to Sharpless Clayton, of West Chester, Pennsylvania, dated January 2, 1855; letters-patent No. 16,708, granted to Alfred A. Blandy, of Baltimore, Maryland, dated March 3, 1857; letters-patent No. 19,916, granted to George Diffenbach, of New York, New York, dated April 13, 1858; letters-patent No. 10,847, granted to Mahlon Loomis, of Cambridgeport, Massachusetts, dated May 2, 1854; and also patented or described in the following English letters-patent, to wit:

No. 11,135, dated March 18, 1846, to Thomas Hancock.
No. 11,208, dated May 15, 1846, to Charles Hancock.
No. 11,209, dated May 15, 1846, to H. V. Bartlett.
No. 12,241, dated August 15, 1851, to E. T. Truman.
No. 13,542, dated March 4, 1851, to A. V. Newton.
No. 24, dated October 1, 1852, to Moses Poole.
No. 43, dated October 1, 1852, to Moses Poole.
No. 577, dated March 14, 1855, to Charles Goodyear, Jr.
No. 893, dated April 21, 1855, to Henri Schoofs.
No. 1232, dated May 1, 1857, to Alfred A. Blandy.
No. 193, dated January 21, 1859, to James Childs.
No. 1842, dated August 9, 1859, to F. L. Lawrence.
No. 2295, dated October 8, 1859, to James Childs.
No. 2790, dated December 8, 1859, to John Macintosh.
No. 4, dated January 2, 1860, to H. A. Dewar.
No. 1549, dated June 25, 1860, to Mathew Cartwright.
No. 1421, dated June 11, 1859, to G. C. Ash.

V. That the pretended invention or improvement described and set forth and claimed in said last-mentioned reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1865, as hereinbefore set forth, or a substantial and material part thereof, was, or substantial and material parts thereof were, in public and common use among dentists and on sale to dentists and others and by dentists and others throughout the United States, at the time of and before the application for said reissued letters-patent last mentioned, and had so been in public and common use and on sale for more than two years prior to such application, and that the said pretended invention or improvement described and set forth and claimed in said last-mentioned reissued letters-patent, or a substantial and material part thereof was, or substantial and material parts thereof were, in public and common use among dentists and others, and on sale to dentists and others and by dentists and others throughout the United States, at the time of and before the application for the original letters-patent numbered forty-three thousand and nine, and dated June 7, 1864, as hereinbefore set forth; and had so been in public and common use and on sale for more than two years prior to such application for said original letters-patent; and such use and sale as aforesaid was had, *inter alia*, by the following-named persons and at the following-named places respectively, to wit:

Clarke S. Putnam, deceased, of and at New York City.

Bradley W. Franklin, of and at the City of New York.

The American Hard Rubber Company of Bethany, Connecticut, and of Flushing, New York, and New York City.

Henry B. Goodyear, of and at New Haven, Connecticut.

E. E. Crofoot, of and at Hartford, Connecticut.

A. W. Todd, of and at Montgomery, Alabama.

James Taylor, of and at Cincinnati, Ohio.

Hawes, Bro. & Seabury, of and at Providence, Rhode Island.

T. H. Burras, of and at New York City.

Spencer Roberts, of and at Philadelphia, Pennsylvania.

A. E. Pursell, of and at Madison, Indiana.

S. S. Blodgett, of and at Ogdensburg, New York.

C. Palmer, of and at Warren, Ohio.

R. Russell, of and at Nashville, Tennessee.

Miller & Hale, of and at Rockford, Illinois.

John McCalla, of and at Lancaster, Pennsylvania.

F. A. Bevin, deceased, at Walpole, New Hampshire, and at Boston and Cambridge, Massachusetts, and at New Haven, Connecticut.

Ira A. Salmon, of and at Boston, Massachusetts.

Willard Ball, of and at Walpole, New Hampshire.

Nathan C. Keep, of and at Boston, Massachusetts.

Roswell Cutler, of and at Boston, Massachusetts.

Samuel Mallett, of and at New Haven, Connecticut.

Elbridge G. Leach, of Stoughton, Massachusetts, at said Stoughton, and at Boston, and at Cambridgeport, Massachusetts.

Seth P. Miller, of and at Worcester, Massachusetts.

Dennis S. Bartlett, of and at Boston, Massachusetts.

Ambrose Lawrence, of and at Lowell, Massachusetts.

VI. That (still denying that said Cummings was the original or first inventor of the pretended invention or improvement described and set forth and claimed in said reissued letters-patent numbered one thousand nine hundred and four) the pretended invention or improvement described and set forth and claimed in said last-mentioned reissued letters-patent, or a substantial and material part thereof, or substantial and material parts thereof, had been in public use and on sale with the consent and allowance of said Cummings for more than two years before his application for said reissued letters-patent, and for more than two years prior to his application for said original letters-patent numbered forty-three thousand and nine, as hereinbefore set forth; and such use and sale thereof was had and made as aforesaid, with the consent and allowance and with the knowledge and acquiescence of said Cummings, among others, by the following-named persons, and at the following-named places, to wit:

F. A. Bevin, deceased, late of Boston, Massachusetts, at said Boston, at Cambridge, Massachusetts, and at New Haven, Connecticut, and elsewhere.

W. A. Bevin, of New York, at Boston, Massachusetts.

N. C. Keep, of and at Boston, Massachusetts.

I. A. Salmon, of and at Boston, Massachusetts.

Seth P. Miller, of and at Worcester, Massachusetts.

Roswell Cutler, of and at Boston, Massachusetts.

Ambrose Lawrence, of and at Lowell, Massachusetts.

B. W. Franklin, of and at New York city.

The American Hard Rubber Company, of Flushing, New York, and of Bethany, Connecticut, and of New York city, at New York city and elsewhere.

VII. That (still denying that said Cummings was the original and first inventor of the pretended invention or improvement described and set forth and claimed in said reissued letters-patent numbered one thousand nine hundred and four) the said Cummings, previous to the date of the said reissued letters-patent, and previous to the date of his application therefor, and previous to the date of the reissued letters-patent numbered one thousand eight hundred and forty-eight, as hereinbefore set forth, and previous to his application therefor, and previous to his application for said original letters-patent No. 43,009, suffered the said pretended invention and improvement or the substantial and material part or parts thereof described and set forth and claimed in the amended and corrected specification signed by him, and annexed to said reissued letters-patent numbered one thousand eight hundred and forty-eight, and again described and set forth and claimed in said reissued letters-patent numbered one thousand nine hundred and four, to be used freely and fully by the public for more than two years, and acquiesced in and permitted and assented to such use without asserting any claim or right thereto, and thereby waived and abandoned the same, and dedicated the same to public use, and surrendered and forfeited or lost any right he might have had in or to said pretended invention or improvement, or to letters-patent of the United States therefor, or under such letters-patent.

VIII. That by English letters-patent, numbered 577, and dated March 14, A.D. 1855, granted and issued to Charles Goodyear, Jr., then residing in Paris, France, the pretended invention or improvement described and set forth, and claimed in said reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1855, or a substantial and material part, or substantial and material parts of said pretended invention or improvement, was or were patented in a foreign country more than six months prior to the application for said reissued letters-patent last mentioned, and more than six months prior to the application, as hereinbefore set forth, for the reissued letters-patent numbered one thousand eight hundred and forty-eight, and more than six months prior to the application, as hereinbefore set forth, for the original letters-patent numbered forty-three thousand and nine, and that the same had been introduced into public and common use in the United States (as hereinbefore more particularly set forth), prior to the application for said reissued letters-patent, respectively, and prior to the application for said original letters-patent, and more than two years prior to said applications, respectively, for said reissued letters-patent numbered one thousand eight hundred and forty-eight and one thousand nine hundred and four, and more than two years prior to said application for said original letters-patent numbered forty-three thousand and nine, wherefore said reissued letters-patent numbered one thousand nine hundred and four were and are null and void.

IX. That (still insisting upon the aforesaid defenses and each of them) the pretended invention or improvement described and set forth and claimed in said reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1865, or a substantial and material part, or substantial and material parts, of said pretended invention or improvement having been so as last aforesaid patented in a foreign country, more than six months prior to the application for said original letters-patent numbered forty-three thousand and nine, said letters-patent numbered forty-three thousand and nine, and dated June 7, 1864, and said reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1865, were by the Acts of Congress in such cases made and provided limited to the term of seventeen years from the date or publication of said foreign letters-patent granted to Charles Goodyear, Jr., as last mentioned, and therefore ceased to be of any force or effect on or before the fifteenth day of March in the year one thousand eight hundred and seventy-two, or on or before the ninth day of September in said year one thousand eight hundred and seventy-two, according as the date or publication of said foreign letters-patent shall be held to have been the fourteenth day of March or the eighth day of September in said year one thousand eight hundred and fifty-five.

X. That, as matter of fact, the aforesaid foreign letters-patent No. 577, so granted as aforesaid to said Charles Goodyear, Jr., were dated March 14, A.D. 1855, and expired under the provisions of the laws of England in such cases made and provided, and under the conditions contained in said letters-patent, on or before the fourteenth day of March in the year one thousand eight hundred and fifty-eight, and that, as matter of law, the said fourteenth day of March, A.D. 1855, is to be deemed and taken in this cause as the date or publication of said foreign letters-patent, and that the term of said original letters-patent numbered forty-three thousand and nine, and of said reissued letters-patent numbered one thousand nine hundred and four, could only have lawfully been for seventeen years from said fourteenth day of March, A.D. 1855, and that said term of said reissued letters-patent therefore expired on or before the fourteenth day of March in the year one thousand eight hundred and seventy-two, and before the filing of the bill of complaint in this cause, and that said reissued letters-patent numbered one thousand nine hundred and four had, for the foregoing reasons, ceased to be of any force or effect whatever before the filing of the said bill of complaint.

XI. That the schedule or specification and claim of said Cummings annexed to and forming part of said reissued letters-patent numbered one thousand nine hundred and four, is informal, insufficient, and void in law, and does not and cannot entitle the said Cummings or his assigns or legal representatives to any exclusive use, possession, or enjoyment of the pretended invention or improvement described and specified in said schedule or specification and claim; and the said Cummings or his assigns or legal representatives cannot hold or enjoy the exclusive right or title to said pretended invention or improvement by virtue of his said reissued letters-patent. That the pretended invention or improvement described and set forth and claimed in the said reissued letters-patent, numbered one thousand nine hundred and four, consists only in the substitution of a material well known and in public use long prior to the pretended invention or discovery of said Cummings for other materials which had long theretofore been known and used for the same purposes, in the same mode, and by the same means described in said reissued letters-patent, or in filling the long theretofore well-known moulds with the long theretofore well-known preparations of india rubber or caoutchouc instead of with metal or other materials, and subjecting the long theretofore well-known material to the long theretofore well-known process of vulcanization in the long theretofore well-known way.

And this defendant, still insisting that such substitution of hard rubber or vulcanite, or its equivalent, was not first invented by said Cummings, but had long prior to his pretended invention been known and used by the persons and at the places specified in the foregoing clauses of this answer marked III. and V., and described in the printed publications specified in the foregoing clause of this answer marked IV., further insists that even if said Cummings were the original and first inventor of such substitution of a plate of vulcanite for the plates of different materials theretofore used, such substitution of one material for another is not patentable subject matter for letters-patent of the United States, and that therefore said reissued letters-patent numbered one thousand nine hundred and four were and are null and void.

XII. That if the pretended invention or improvement described and set forth and claimed in the said reissued letters-patent numbered one thousand nine hundred and four embraces or comprises the means or mode or method of obtaining the impression of the mouth and of preparing the moulds and of setting the teeth in the moulds, or the method of making and using said hard rubber or vulcanite plates set forth in said reissued letters-patent, then said reissued letters-patent were and are null and void, for the following among other reasons:

First. Because said Cummings was not the original and first inventor of such means or mode or method of obtaining the impression of the mouth, or of preparing the moulds, or of setting the teeth in the moulds, or of the method of making and using said hard rubber or vulcanite plates, set forth in said reissued letters-patent, but the same or substantially the same means or modes or methods had been known and used and patented, and described in public works long prior to such supposed invention by said Cummings, by the persons and at the places and in the printed publications specified in the foregoing clauses of this answer, marked III., IV., and V.

Second. Because such pretended invention or improvement, so described, set forth, and claimed in said reissued letters-patent, was not described, suggested, or indicated in the specification or drawings of said original letters-patent numbered forty-three thousand and nine, but was new matter interpolated in said reissued letters-patent numbered one thousand nine hundred and four, such interpolation of said new matter in said reissued letters-patent making a radical change in the specification and in the pretended invention or improvement described and set forth and claimed in said reissued letters-patent from the pretended invention or improvement described and set forth and claimed in said original letters-patent numbered forty-three thousand and nine.

Without this that any other matter or thing in the said complainant's bill of complaint contained material or necessary to make answer unto, and not herein and hereby well and sufficiently answered, traversed, confessed and avoided, or denied, is true to the knowledge or belief of this defendant.

All which this defendant is willing to aver, maintain, and prove as this honorable court shall direct, and humbly prays to be hence dismissed with his reasonable costs and charges in this behalf most wrongfully sustained.

W. H. GATES.

UNITED STATES OF AMERICA, }
EASTERN DISTRICT OF PENNSYLVANIA. } *ss.*

William H. Gates, the above-named defendant, being duly sworn, says that he has read the foregoing answer by him subscribed, and knows the contents thereof, and that the same is true of his own knowledge except as to matters which are therein stated to be on his information or belief, and as to those matters he believes them to be true.

W. H. GATES.

Subscribed and sworn to before }
me this 12th day of May, A.D. }
1873. }

{ NOTARIAL }
{ SEAL. }

FRANK M. ETTING,
Notary Public.

IN THE

Circuit Court of the United States

IN AND FOR THE EASTERN DISTRICT OF PENNSYLVANIA IN THE THIRD CIRCUIT.

GOODYEAR DENTAL VULCANITE COMPANY et al.
vs.
WILLIAM H. GATES.
C. C. U. S.
In Equity.

The replication of the Goodyear Dental Vulcanite Company and Josiah Bacon, complainants, to the answer of William H. Gates, defendant.

These repliants, having and reserving unto themselves all and all manner of advantage of exception to the manifold errors and insufficiencies of the said answer for replication thereunto, say that they will aver, maintain and prove their said bill to be true, certain and sufficient, in the law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by these repliants: without this that any other matter or thing in said answer contained material or effectual in the law to be replied unto, confessed and avoided, traversed or denied, is true, all of which matters and things these repliants are and will be ready to prove as this honorable court shall direct, and humbly pray as in and by their said bill they have already prayed.

For complainants,
GEO. HARDING,
J. E. SHAW,
Solicitors.

True copy.
[L. S.] SAMUEL BELL, *Clerk Circuit Court U. S.,*
Eastern District of Pennsylvania.

THE

DENTAL COSMOS.

VOL. XV. PHILADELPHIA, SEPTEMBER, 1873. No. 9.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,
FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

(Continued from page 398.)

THE peculiar tendency of the past half-century is decidedly toward luxury, and those who still possess most energy, of either thought or action, seem to expend these in greatest quantity for the furtherance of this paramount desire. This is not alone noticed in any one direction, for each demand is quickly and constantly supplied, and even tempted to greater indulgence by the offerings of ingenuity. In order that we dentists should endeavor to appreciate fully the strength of those opposing influences which still frequently seem to stamp our efforts in the arrestation of dental caries as futile, we must look at the subject from that stand-point which shall command the broadest view. Thus it is that *all* generally enervating causes are accredited with a due proportion of power for harm *in our special direction*, and it will be found that the ratio of success in practice in the saving of the teeth will be in exact proportion to the importance conceded to collateral as well as principal causes, combined with the degree of intensity of counteracting effort which can be induced on the part of patients. We must not ignore, as foreign to our subject, the advances in luxury which pertain to the dwellings in which our patients reside; these are rendered more than ever enervating with the "improvements" of each year: the methods for heating; the means for lighting and the incidentals to these, as imperfect combustion of gas, odorous emanations from coal oil, etc.; the methods for washing, with water piped just where needed; the speaking-tubes which prevent the need of sufficient lung-effort to call domestics, the water-closet, which, while introducing the most deleterious air (see hospital reports in relation to fecal and urinary exhalations) into at least one apartment of the house, preclude the necessity for obtaining even a few breaths of out-door air once a day; the double windows and window-strips which so effectually shut out pure air and confine the impure, but which offer such powerful arguments on the score of increase of comfort and decrease of expense; all these are but a few of the daily surroundings whose influences we have to combat,—all these are ostensibly for the purpose of saving strength; and the same tendency is indicated in the first thought which is evolved with the leaving of them,—the glance is to note the approach of that car which shall save the necessity for exertion, and thus it is that our male patients are carried to palatial stores and counting-rooms, while our female patients merely order their carriages when they would be conveyed. Thus it is that healthful exposure and natural exertion, those givers of strength and endurance, are abnegated, and the foundation for general debility established. But it is also the result of experience, that even with all the ingenuity referred to, not only are the strength-producers put away, but another depressant is added in proportion to possessions,—this is *care*,—a constant source of anxiety,—a ceaseless trouble,—an ever-present cause of irritation which tends naturally to exhaust irritability. Few persons, except the observant practitioners of dentistry, have any idea of the immediate action upon the teeth which results from this systemic condition; numerous are those who recognize the sentient and nutrient intricacy of the fifth pair; numerous are they who know the frequency of ophthalmic complications in connection with general weakness; comparatively numerous are those who readily admit the presence of adynamic facial neuralgia, with all its fearful suffering and almost unconquerable persistence; some among patients have even been impressed with the conviction that their teeth ache when they are tired, and that there is general tenderness of teeth concomitant with fatigue,—but it is, as I have said, only the observant practitioners of dentistry who, knowing all these things and seeing in them the immediate sympathy with *general* weakness on the part of the trifacial nerve,—that sympathy which is rarely equaled and perhaps not exceeded in any other portion of the economy,—and recognizing also that this nerve is nutrient to the organs under their charge, view as a matter of course that extent and rapid progress of decay which they find in the teeth of those who are suffering under systemic depression. This interference with proper dental nutrition is found also not only in connection with that "care" which is entailed by habits of luxurious living, but it is also notably induced by "care" in every form, and thus we see it developed in patients who are weakened by *anxious* nursing of sick relatives, or who succumb to struggles for appearance under pecuniary difficulties, or who suffer severely from mental emotion, or who strive beyond their strength in following what they conceive to be their line of duty; and this brings us to notice the almost universal remark which these patients make in explanation of the condition in which we find their teeth, viz., that they have not had the time, or indeed the thoughtfulness, of late, to bestow upon them proper attention; as if even immoderate scrubbing, with a hard brush, five times daily, would have done anything to have counteracted, even locally, the injurious influences which were at work.

Again, we notice that brain taxation drains the nerve-power to that degree which deteriorates notably dental nutrition in common with general nutrition. I have had unusual opportunity for observation in this direction, from having a large proportion of young patients, and have for many years watched with sad interest the epidemic dental troubles which are associated with the almost superhuman efforts of children who are studying for what is termed "promotion." It is with difficulty that I refrain from so great a deviation from my subject as to add my expostulatory testimony in antagonism with the cramming system of education now indulged in; for, although it is but seldom that I see so grievous illustrations of its folly as to compel the interdiction of its continuance from dental considerations, yet even this has come, time and again, during my practice, and the beneficial results accruing from its discontinuance have so immediately proven the intimate connection between depression from this cause and the induction of dental suffering, as to have soon convinced even the most skeptical. I must say here that dental troubles other than marked increase of caries are much more prominent results of over-study,—these are pulp irritation, peridental irritation, and the re-establishment of abscess in cases of previously abscessed parts, which, under ordinary circumstances, would have remained comparatively healthy; but we must recognize that the crevicing around fillings and the establishment of new cavities of decay may well be due to such systemic condition as will provoke pathological expressions of seemingly so much greater gravity. Under the circumstances to which I have referred as exercising largely a controlling power over systemic conditions during life, we find other, and possibly more occult considerations, in relation to what I shall term the *periodic* induction of caries. During all of young life there is, beside the effort on the part of vitality to maintain its own integrity, that extra effort which is to accomplish increase of structure or "growth," as it is termed. This is normal when prosecuted under normal first power and normal aid; but when we view all this pathologically it becomes a sorry picture of helpless striving. I have shown that, under such circumstances, vitality was sometimes found inadequate to carry through the eruption of the deciduous teeth, and death was the result of the irritation attendant upon this process; but in less degree than this we have all through the first twenty years of life a combat for *supremacy* between the powers of integration and disintegration. In this war of atoms, when carefully regarded, we find no indicators of the relative triumph of the one or the other which so surely inform us as the teeth. The progress of their eruption, the rapidity of their growth, the development of the quality of their material, the differences in this respect between individual teeth in any given mouth, their tendency toward decay, the actual presence of this disease, the arrestation of it without apparent cause, its subsequent recurrence and further arrestation, the different types of decay, whether slow or rapid, white or yellow, circumscribed or distended, general or otherwise, all point to condition of system with unerring certainty; and, regarding these as our guides, we have forced upon us the inference that a certain amount of life-force implanted in a germ, being insufficient to carry on existence from the high standard of "health," recognizes the fact, and is endowed with the power of selecting for its nurturing care such tissues and such organs as are indispensable to the maintenance of its integrity, while permitting other tissues and organs to depend, for the time, upon such physical characteristics for resistance to disintegration as they have been endowed with by previous effort on the part of vitality, added to which may be such extraneous aid as it is ordained should be derivable from intelligence. The ability upon the part of vitality to accomplish this work satisfactorily upon each occasion of demand, either alone or with proper assistance, is indicated by the gradual disappearance of the observable necessity for aid and the consequent re-establishment of apparent health. In this connection I cannot too strongly insist upon the almost universally reliable testimony of the teeth, and this particularly when the previous systemic inability has been *general*, and perhaps *intangible*, rather than special and perhaps quite tangible. The fact that other special indicators of abnormal systemic condition exist, is not to be regarded as rendering the testimony of the teeth less valuable, for even in these cases the teeth are frequently strangely corroborative, and thus it is that patients constantly remark, as the result of a satisfactory dental examination, that they "do not know why their teeth are so much better than those of their acquaintance who require much dental aid, when their own share of sickness is so much greater."

Inadvertently they give the reason for it, in the evidently greater predisposition, *structurally*, of some other than dental tissue. This is the only explanation we can offer for the good teeth of patients of tuberculous diathesis, a peculiarity which usually pertains to those who suffer with tubercle in either lung or mesentery.

The action of vitality, to which I have referred as a temporary abandonment of non-essential organs, for the purpose of the needed bestowal of greater power upon essentials, has, as I have intimated, led to the observation of a species of periodicity of dental decay. By *periodicity* of decay, I mean the increased liability to its occurrence at certain periods of life. While the presence of dental caries is a more or less constant thing during youth, even at this time of life there are years during which the tendency toward decay exists most markedly. These are most apt to be from five to seven or eight years of age, from eleven to fourteen or fifteen, and variably from that age to about twenty or twenty-two. This is explained upon the ground that it is natural that formative and recuperative power should be most equalized *until extra demands are made upon it,* and that these are usually required when the child is passing through that period at which are incident the ordinary diseases of childhood (from five to eight). It is truly instructive to watch the almost irresistible tendency toward decay which results in children who expend vitality in maintaining that systemic condition known as "pretty well," and who have the ordinary diseases "lightly"; and it is, moreover, truly a comfort that, being forewarned by this knowledge, we are forearmed, and that through the instrumentality of watchfulness from practitioner and assistance from parents and little patients, we can so direct as to almost entirely ward off harm. Almost always after children pass through the ordeal of ordinary diseases, there is an apparent rest upon the part of the life-force,—they eat well, sleep well, enjoy themselves, study fairly, do not grow much, and have exemption from toothache, and only a very occasional necessity for any dental operation. This period is usually between eight and eleven years of age.

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 401.)

THE REGION OF EXPRESSION—*Continued.*

Surgical Anatomy.

WE have found that the muscles of expression have two centers of motility,—the inner portion of the brow and the angle of the mouth. The main line of motion of the former is from the side of the region toward the median line, and of the latter from the median line to the side: for we frown, *i.e.* contract, the brows, with greater ease than elevate them; and smile oftener than "purse" the mouth. It is necessary, lest the pen run away with our judgment, to leave the inviting field of physiognomy and study the region of expression from a surgical point of view. But before doing so we beg the space of a paragraph to speak of two things.

The first of these is the curious expression often seen in cases of shock after injuries, and which appears as a prodrome to insidious symptoms. "The countenance," writes Dr. Geo. McClellan,* who has well described this sign, "is unnatural. It presents an inquiring, anxious look about the forehead, eyes, and upper portions of the face, while all about the mouth and lips is smiling and composed." The second is the expression of the face due to loss of antagonism of the muscles, or to distortions consequent upon pressure of tumors. Facial palsy is a subject of such importance that we must reserve its consideration; the distortions from pressure will be alluded to incidentally as we point out the anatomical relations of morbid growths. Of what do we then speak? Of a very important feature; concerning which both palsy and mechanical distortion are interested, and to which the retracted and depressed oral angle are common,—namely, the effect of an active platysmus myoid muscle upon the inactive or weakened tissues of the face.

Revenons à nos moutons! The region of expression is remarkable in the arrangement of *the fascia.* In most regions of the body there is found after removal of the skin two delicate divisions of connective tissue, the superficial layer permitting free motion of the skin upon the muscles, and being a favorite site for deposition of fat, the deeper one affording vaginæ to the muscles, and fixing the direction of their lines of traction. In the region before us we find a different arrangement. The skin here is not separated from the fat which lies beneath it, nor are the muscles ensheathed, but instead, the fat and muscles are intricately associated. Indeed, the only muscle of the face having a fascial covering is the buccinator.

This absence of fascia is compensated for by cushiony masses of connective tissue, which are conspicuous in the following localities: the hollow of the cheek; beneath the zygomaticus, and over the buccinator muscle, especially near the root of the coronoid process; beneath the lower fibers of the orbicularis palpebrarum, particularly where it overlaps the elevators of the upper lip; between the latter muscle and the elevators of the oral angle; at the groove for the facial artery as it passes over the lower jaw; and at the symphysis beneath the depressor of the lower lip.

The skin of the face is everywhere thin, so that its scars are as a rule inconspicuous. A very different result follows extensive cicatrization of the deeper parts. Here, as seen after ulcerations from mercurial sore mouth, or destructive stomatitis from any cause, the connective (*i.e.* fibrous) tissue is abundantly present, and serves to contract the oral fissure, and for the most part converts the cheeks into intermaxillary ligaments binding the jaws. Hence we find in such cases anchylosis of the temporo-maxillary articulation.

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* Surgery, p. 18.

In conditions more exactly approximating the normal one, as in ecchymosis following injuries, or in facial emphysema, we have proof that there is free communication through the region of expression by means of connective tissue. Ecchymosis is commonly limited to the injured spot. But sometimes, as in old persons, it may be extensive. After fracture of the jaw, ecchymotic swelling may rapidly spread from the point of lesion under the skin of the neck and upon the chest upward to the cheek, to the lower eyelid of the opposite side, as well as inward to the mucous membrane of both hard and soft palate. Emphysema of the face is more rare. It follows fractures of the frontal bone over the frontal sinus, when it will be limited to parts about the forehead; or ensues upon an ulcer of the mucous membrane. T. P. Heslop* narrates a case of emphysema in a little boy, aged four years, who, while recovering from measles, was attacked with ulcers at the angle of the mouth. Emphysema extended thence downward from the mouth along the entire length of the trunk. The disease terminated in death. It was found at the autopsy that the mucous membrane at the oral angle was separated from the integument, "so that the handle of a scalpel could be inserted nearly an inch into the cheek."

The Fat.—The fat of the face is abundant beneath the cheeks, but is sparsely distributed upon the lips, nose, eyelids, and forehead. The fibers of some of the muscles are interspersed with lobules of fat, as is notably seen in the depressor of the lower lip. As a rule, however, it lies either beneath the skin and around the more superficial muscles, or is less uniformly distributed among the deeper ones. A pad is quite constantly found beneath the quadrate elevator of the upper lip and the elevator of the oral angle, and a second between the latter muscle and the bone about the infra-orbital nerve at this point.

The fat everywhere presents a granulated appearance in the infant. The fullness of the cheek in the young is not due to the superficial layer alone, but to the deeper-seated mass lying partly upon the buccinator and partly upon the masseter muscle. This has received the name of the "button," from its figure, which is abruptly constricted at its base where it is continuous with the fat of the temporal fossa. The "button" resembles omental fat; it is surrounded by capsule-like connective tissue, and is crossed by branches of the transverse facial nerve. The prominence of the cheek is made yet more decided by the receding chin. As a natural result, should a child slip and fall upon the face, the cheeks suffer. If the laceration passes through the cutaneous layer of fat, and involves the "button," this structure may appear between the lips of the wound, as was seen in a case of Boyer's.†

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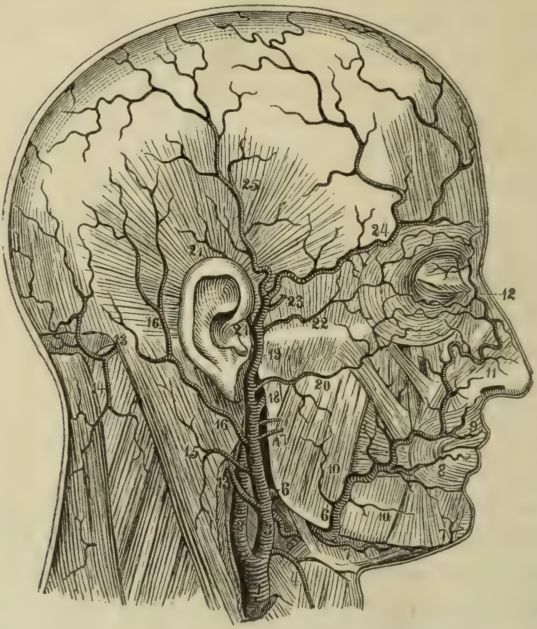
* Med. Times and Gazette, 1868, 138.

† Recorded in Blandin's Surg. Anat., Am. ed., p 85.

The Arteries.—The arteries of the face are the facial, internal maxillary, and some of the terminal branches of the ophthalmic.

FIG. 2.—SUPERFICIAL ARTERIES OF THE FACE.



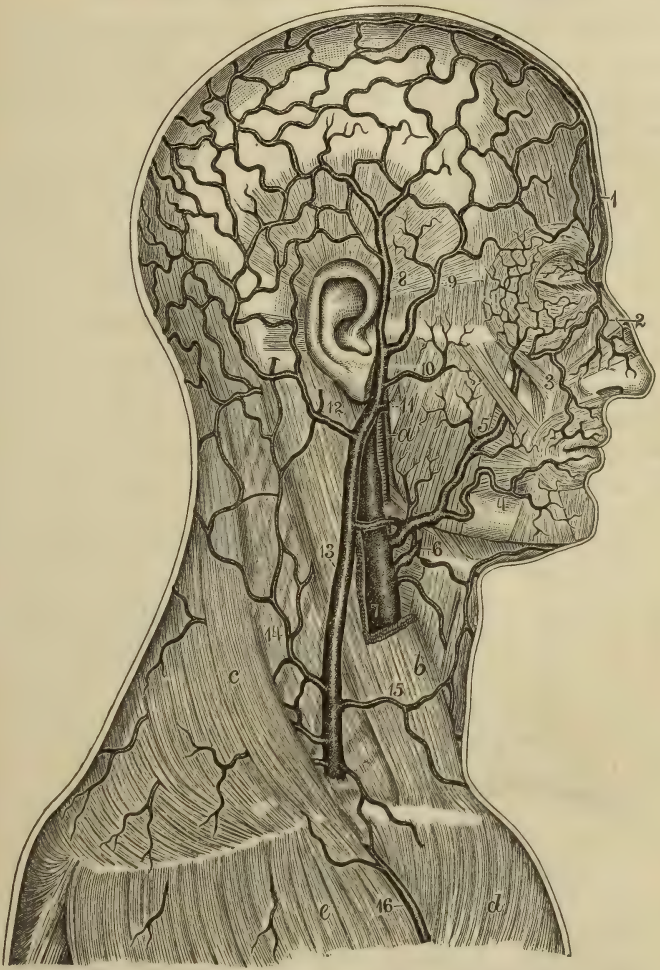
6, facial artery; 7, submental; 8, inferior coronary; 9, superior coronary; 10, muscular branches; 11, small nasal branches; 12, angular artery.

We will treat here only of the facial (Fig. 2, 6). This vessel is the second branch of the external carotid, and passes obliquely upward and inward toward the median line of the face. It is divided into cervical and facial portions; the latter again into the mandibular, oral, and angular or nasal.

The *cervical portion* is short and tortuous. It lies in the loose connective tissue of the supra-hyoid space, and is remarkable for its intimate relation with the submaxillary salivary gland. It gives off a small branch, the submental (Fig. 2, 7).

The *mandibular portion* lies upon the lower jaw. It is covered by the *platysmus myoides*, and has the facial nerve lying to the outer side. At the oral region the artery passes directly to the outer side of the fleshy angle of the mouth. It is here covered by the *zygomaticus major* and the facial slip of the *quadrator labii superioris*. It again becomes superficial at the inner border of the latter muscle, when it is named the *angular* artery. No branches of note are given off from the outer side of the facial. The inferior labial branch (not shown in Fig. 2) goes to the muscular tissue and skin of the chin. The coronary branches (Fig. 2, 8, 9) go to both upper and lower lips, and present the following peculiarity,—they lie near the mucous membrane. This is particularly noticeable in the superior coronary branch. Its pulsation can be readily felt by the finger when placed within the mouth. Occasionally blows upon the lip will lacerate the walls of this vessel, when hemorrhage of a confusing character may take place. Mr. Erichsen* narrates an instance where bleeding from the above cause was allowed to take place unnoticed until, from the amount of blood which had been swallowed, the stomach rejected a large clot, to the great alarm of the patient and surprise of the physician.

Fig. 3.—The Superficial Veins of the Face.



1, frontal vein; 2, nasal vein; 3, 4, labial veins; 5, facial vein; 7, internal jugular vein; 11, internal maxillary vein.

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* System of Surgery, Am. ed., p. 378.

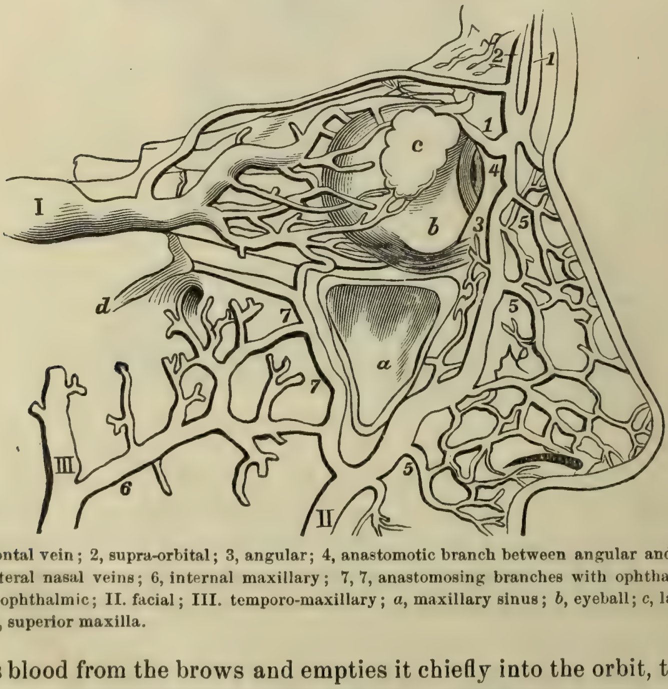
The most important practical relation, however, of the facial artery, is at the point where it crosses the lower jaw. In consequence of the loose connective tissue at this point, when the vessel is divided the cardiac end will retract to a great distance, and much trouble is experienced in finding it.

The Veins.—The veins of the region of expression are of two kinds, the superficial and the deep. The superficial are the frontal, the supra-orbital, and the facial; the deep are the ophthalmic, the maxillary, and the infra-orbital.

The frontal (Fig. 3, 1) arises from the anterior portion of the scalp and the forehead, and receives some branches from the anterior temporal. It passes down near the median line of the forehead to terminate partly in the branches of the ophthalmic, and partly in the facial vein. In the living subject the frontal vein is well seen during the acts of frowning and laughing: the former in consequence of the frontal turgescence caused by the adduction of the brows on the vessel; the latter, by the contortion of the parts about the cheeks and mouth, preventing an easy descent of the frontal blood along the facial vein, and compelling it to take the narrower channel through the orbit.

The supra-orbital (Fig. 3, 2) is a smaller trunk than the frontal. It carries blood from the brows and empties it chiefly into the orbit, though sending an anastomotic branch to the facial. The main portion is re-

Fig. 4.—Diagram of the Veins of the Face and Orbit.



1, 1, frontal vein; 2, supra-orbital; 3, angular; 4, anastomotic branch between angular and frontal; 5, 5, 5, lateral nasal veins; 6, internal maxillary; 7, 7, anastomosing branches with ophthalmic and facial. I. ophthalmic; II. facial; III. temporo-maxillary; *a*, maxillary sinus; *b*, eyeball; *c*, lachrymal gland; *d*, superior maxilla.

markable for running the entire length of the orbit before joining the ophthalmic.

The facial vein (Fig. 4, II. 3) at its beginning lies at the side of the root of the nose, where it is accompanied by the terminal portion of the facial artery. It soon, however, leaves the artery, and, pursuing a less tortuous course than it, descends the face beneath the orbicularis palpebrarum; avoids the region of the oral angle, but affects that of the hollow of the cheek. Here it lies beneath the zygomaticus major in front of the parotid duct, is crossed by branches of the facial nerve, and is surrounded by loose connective tissue and fat. It again approximates the facial artery at the mandibular region, lying to its outer side. The facial vein receives numerous tributaries from the nose, lips, and chin. It is important to remember that the vessels of the latter locality pass into the anterior jugular as well.

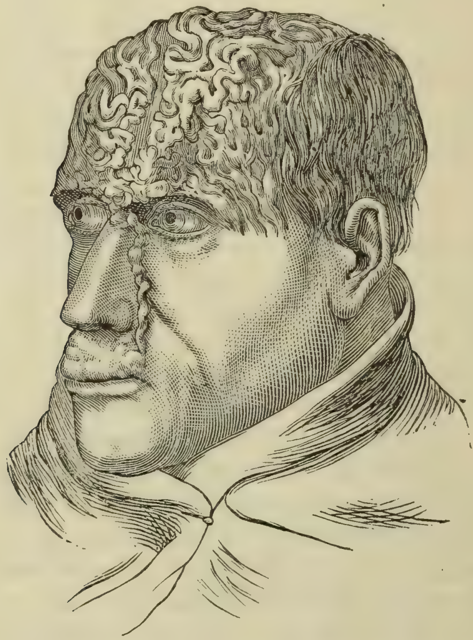
Of the deep veins we need say little at this time. We have seen how the ophthalmic (Fig. 4, I.) receives most of the blood from the forehead, and are prepared to learn that the internal maxillary, which answers to return the blood of the artery of the same name, will communicate with the facial vein at more than one point, as well as with the ophthalmic vein.

It will be seen that the venous supply of the face differs in some important particulars from that of the trunk or limbs. In the last named localities both deep and superficial currents flow in the same direction towards the heart. But in the veins of the face a marked contrast presents itself. The facial trunk for example is not formed by primal capillary tributaries, as is commonly the case, but by communicating branches (Fig. 4, 1, 4) with the frontal and supra-orbital veins, and a transverse branch found at the bridge of the nose. It is highly probable that much of the blood of the inter-orbital space and the locality about the inner canthus flows through the orbital conduits to the cavernous sinus. Farther down the face we find the infra-orbital artery associated with venæ comites. These, which are peculiar, since no other facial vessel possesses symmetrical accompanying veins, promptly join the orbital series, or aid in swelling the volume of the internal maxillary vein. The veins corresponding to the deep parts of the face other than those mentioned also seek outlet in the same trunk, so that much of the superficial blood of the upper part and side face passes *inward* to the brain-case and the interior of the facial region, while the remaining portion only flows *downward* to join the superficial jugulars.

Viewing the subject from a clinical aspect, which is the one which we as professional men will naturally select, we cannot fail to note that in cases of inflammation of the veins of the face the spread of the disease is *upward*, except when the disease originates in the lower lip, when, as a rule, it is downward. We can explain these phenomena in no other way than by stating that the venous blood naturally flows upward from the upper lip and sides of the nose, and downward from the lower lip and chin. The absence of valves in the veins of the face explains the rapid spread of facial phlebitis when it has once been fairly inaugurated.

The most fertile cause of phlebitis is a peculiar pustular affection which has received the name of *facial carbuncle.* An outline of its symptoms is something as follows: A pimple forms at about the alæ of the nose and upper lip, although it may be seen in the lower, which is only remarkable for the pain which accompanies it. By the third day it is matured, and on the following day, if the disease takes a light phase, desquamation may be announced without apparent formation of pus. But, as a rule, pus forms in small quantity with or without an accompanying rigor, and the surrounding integument becomes brawny and of stony hardness. By the fifth day the eye is suffused and sensitive to light, and tender on pressure. At the end of the week it protrudes, and the vision is lost; or the lids are firmly closed and œdematous. The frontal veins may be involved, when the skin of the forehead will be swollen and reddened. Agonizing pain is now suffered; delirium happily ensues, and death ends the scene. Examination of the parts after death shows the facial vein *above* the pustule filled with pus, and the cavernous and circular sinuses occupied with a soft reddish clot;

FIG. 5.—MR. SYLVESTER'S CASE OF FACIAL PHLEBITIS (see page 461).



secondary abscesses may be found in other parts of the body. When the lower lip is affected, the swelling is apt to extend either laterally from the side of the pustule to the ear, and downward along the neck. Death in such cases is due to exhaustion or to pyæmia.*

Facial phlebitis, while a frequent result of carbuncular inflammation, is not dependent upon it. It may be excited by the bite of a dog or sting of an insect. Rarely it is of idiopathic origin. Of this the following case is an example: A soldier,† aged forty-two, was attacked with fever, followed by redness and slight swelling of the forehead. This swelling soon became more pronounced along the course of the fronto-temporal veins, which were hard, prominent, and of a violet color. The eyelids were œdematous, and the conjunctiva chemosed. The symptoms as described above followed, and the patient died about the seventh day.

A case (Fig. 5) recorded by Mr. T. H. Sylvester‡ is interesting, from the fact that the orbital veins escaped, and the frontals determined the extent of the inflamed tract. A puncture of the lip excited the phlebitis, which extended to a small vein at the outer side of the nose, thence to the inner canthus, and from that point along the frontal vein to the scalp, which became extensively infiltrated with pus. The case terminated fatally at the end of five weeks.

(To be continued.)

ABRASION AND EROSION.

BY CHARLES R. E. KOCH, CHICAGO, ILLINOIS.

(Read before the Joint Session of the Illinois and Iowa Dental Societies.)

There is such vagueness in the description of some of the abnormal conditions of the teeth in our literature as frequently to confuse and perplex one in attempting to define or recognize them one from another. Thus we find the words *abrasion*, *mechanical abrasion*, *spontaneous abrasion*, denudation, erosion, etc., employed to signify conditions of the teeth which, no doubt, could be much easier understood by a more uniform and less profuse nomenclature.

If we sum up all that has been written by the various authors upon these subjects, we find that all the above names have been applied to diseased conditions of the teeth which, beyond question, could be better arranged under two names according to their origin.

The word *abrasion* has been quite generally applied, but let us examine how properly; the word, in medicine, signifies "an excoriation or suppuration of the skin." As we cannot employ it in that sense to any disease of the solid tooth tissue, we must inquire for its literal meaning, which is synonymous with attrition and friction. Such a definition presupposes mechanical agencies, and for this reason the word *exactly* describes one class of these difficulties, and if its application were strictly in conformity to this meaning, much confusion of terms would be avoided.

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* In three cases recorded by Prof. Parker (New York Med. Journ., vol. xii., 368), all began at the lower lip. The upper lip became involved in two of them, with the head symptoms as above given. In two the lower lip sloughed.

† M. Blachez, Gaz. Heb., 1863, 716

‡ Med. Chir. Trans., xxiv., 36.

As applied to our specialty, we would define abrasion as that gradual loss of tooth-substance produced by the attrition of the teeth upon one another, or that of foreign bodies upon them.

The adjectives chemical and spontaneous have been prefixed to the word abrasion, to distinguish a similar loss of tooth-substance which cannot be attributed to mechanical agencies; but if we adhere to the literal meaning of the word, the use of these is plainly inadmissible, and we must look elsewhere for a more proper designation of this diseased condition. Denudation, denution, or loss of tooth-substance by the denuding process, are other terms employed to designate this form of disease, and perhaps it may not be amiss to inquire into the propriety of employing them. According to Dunglison, denudation means "a condition of a part deprived of its natural covering by wounds, gangrene, or abscess; it is particularly applied to the bones when deprived of their periosteum, and to the teeth when they lose their enamel or dental substance, or when the gums recede from them and their sockets are destroyed." It is plain that, if in its medical signification the word implies all this, it is not specific enough for the difficulty in question. Literally the word means a *laying bare, depriving of covering;* in this sense, at a first glance, it would seem very expressively applied, but does not abrasion (mechanical) deprive of covering? Does not fracture of the enamel do the same? Does not caries often deprive the pulp of its covering of enamel and dentine? Is not the dentine often laid bare in atrophy? Affirmative answers of these questions clearly prove that although the word is expressive, yet it is not distinctive. Erosion is a word that has very rarely been employed in this connection. In medical language it signifies "the action of a corrosive substance, or the gradual destruction of a part by a substance of that kind; it is often employed in the same sense as ulceration." Literally, it means an eating away. No doubt this word is more distinctive, and as its definition in medical terminology (excepting the last clause), as well as its literal meaning, is in harmony with its present generally assumed pathology, we shall employ it.

ABRASION

generally commences upon that portion of the masticating surfaces which is in apposition with the antagonizing tooth, unless it is caused by the friction of foreign bodies upon the teeth. Prof. Wedl, so far as is known to us, is the only author who mentions (as a fact familiar to every dentist) an abrasion occurring upon the proximal surfaces of the teeth where they come in contact with adjoining teeth, and which is produced by their motion within the sockets during mastication.

The same author also states that from the degree in which the teeth are worn away, taking into the account the variations of color of the teeth, the changes presented by the alveolar border, etc., and also individual peculiarities such as density, we may, after considerable practice, determine the age of the individual within at least five years.

As a rule, the progress of this condition, when owing to attrition of mastication, is very slow, and no discomfort is experienced; and were it not for the deformity of chin coming to meet the nose, which we so often meet with, giving the appearance of toothlessness, perhaps our operative interference would, in most cases, not be called for. It most frequently occurs in men of very rugged constitution, and with broadly-developed jaws and firmly-set and well-shaped teeth. We frequently are told by our patients how their revered ancestors had never lost a tooth, and had "double teeth all around"; they mistaking the result of abrasion for a congenital *lusus naturæ.*

Occasionally we find upon the abraded surfaces, especially upon the molars, saucer-shaped indentations, which are much below the general level of the surface, and without any corresponding convexity upon the antagonizing tooth, but frequently with a similar concavity opposed to it. These concavities are of a darker color than the surrounding tissue, and generally correspond to the points of original dentification. They are probably created by the attrition of the food after the enamel has become worn away from the prominences, leaving exposed islands of dentine which, being softer, yield more readily than the surrounding enamel. These depressions are generally sensitive to thermal changes.

Mr. Mummery (*Trans. Odontological Society of Great Britain,* 1865), having instituted extended investigations, claims that there is a notable difference with respect to the form in which, and the means by which, the teeth become worn away. Nations like the Egyptians and the Indians of the northwest coast of America take but little care in the preparation of their food, which often contains sand; their teeth are usually worn away early. If the food consists of hard seeds, roots, or tough meat, then the surfaces of the first molars are worn upon the lingual side in the upper jaw and upon the labial side in the lower jaw. With those who subsist on an abundance of highly nitrogenous food, the pulps of the teeth gradually become solidified with secondary dentine, and the tooth frequently is worn away as far as the neck without the occurrence of an alveolar abscess; on the contrary, in cases where there is a defective nourishment, inflammations, abscesses, and extensive absorption of the alveoli are constantly observed.

Mr. Charles S. Tomes, in the appendix to his recent work, states that Professor Broca has observed that, in the ancient populations of Europe, caries was far less frequent than at present, but the teeth were usually excessively worn down; but that the mere wear is of itself insufficient to have prevented the ravages of caries, is shown by the fact that the Basque crania (eighty in number) in the Paris Museum were alike remarkable for the extent of the wearing down, and also for the tolerably frequent occurrence of caries.

Abrasion being always plainly attributable to mechanical causes, it would be difficult to prove that any particular condition of the affected tooth is an essential to its beginning. It is even doubted whether temporarily diminished vital function within the tooth may be considered as furthering the progress of the malady, as teeth with devitalized pulps do not appear to abrade in a more rapid degree than those with their vital organs entirely unimpaired.

Abrasion of individual teeth may be owing to a malarticulation, either original or acquired. Thus, a lateral incisor twisted upon its axis so that one of its corners strikes the antagonizing tooth squarely, is liable to have this corner abraded. The extraction of some posterior teeth, by throwing the weight of mastication upon the anterior, will very soon cause abrasion upon these. The loss of any tooth may in time be followed by a change of articulation of the remaining teeth, and subject some of them to abrasion.

An ingrowing upper incisor will almost invariably become abraded on its anterior cutting edge, so as to make an inclined plane of it. It is somewhat singular in these cases that the abrasion always occurs on the tooth that is out of its normal position, and may not this be accounted for by a constant desire, so to speak, of the tooth to correct its malposition and movement in that direction, as particle after particle becomes worn away? Such cases we often meet in children of tender years.

Friction of badly-adjusted clasps and ill-fitting plates may abrade the surfaces of the teeth in contact, but in nearly all such cases these abraded surfaces soon become the seat of caries. Yet cases do occasionally occur where the enamel has become entirely worn through, and considerable inroad made upon the dentine, and yet there is no sign of caries.

A middle-aged man, who had lost his upper incisors, and was in the habit of using a clay tobacco-pipe, holding it between his right cuspids, had these so abraded that when his jaws were closed there was a round opening between them freely admitting a lead-pencil.

Other mechanical agencies, such as too stiff tooth-brushes and gritty and insoluble tooth-powders, have been charged with the gradual wearing away upon the cervical border of the buccal and labial surfaces; but it is deemed very doubtful what influences, if any, such agencies exert in producing these cases in teeth with perfectly healthy enamel.

Treatment of abrasion from mastication can hardly be other than mechanical, and consists in preventing the further attrition of the teeth by substituting gold for the worn-away substance, in such of the teeth as shall appear to be the most favorable for the operation and its success. When abrasion is of rapid progress and accompanied by great sensitiveness of the teeth, it may sometimes be necessary to make swaged caps of gold from an impression of the teeth, leaving these a little larger than the teeth, by placing some paper or sheet lead or tin upon the male die. The tooth to which this cap is to be applied being thoroughly dried, some oxychloride of zinc is prepared, put in the cap, and the appliance then placed in position. This may be removed from time to time for examination, and finally, after the tooth is strong enough, a permanent gold filling may be substituted for it.

If the abrasion is produced or furthered by an unnatural grating together of the teeth, frequently by calling the patient's attention to the fact it may be to a great extent avoided.

When individual teeth have become abraded through friction of clasps of artificial dentures, these should be so altered as to prevent further rubbing.

Abrasion upon the proximal surfaces, described as *interstitial* by A. Zsigmondi (in *Vierteljahrsschrift für Zahnheilkunde*, 1865), can scarcely be reached by remedial treatment, unless it becomes the seat of caries. Irregular position of individual teeth, which predisposes them to abrasion in such a degree as to jeopardize their beauty or usefulness, should be corrected. The loss of certain teeth having produced a change of articulation which has resulted in abrasion of certain teeth, and which is of such a nature as to threaten a deformity of these teeth, may often be remedied by the insertion of artifical teeth to complete the denture. Perhaps, in this connection, it may not be uninteresting to cite a case that has come under my care.

In the mouth of a gentleman who had lost his upper bicuspids and first molars, the other molars gradually tipped forward, and at the same time the lower jaw moved forward so as gradually to form a very marked protrusion, some of the upper incisors had been built out with gold, and these fillings, as well as the teeth, were being fast worn away upon the anterior cutting edge. A gold atmospheric pressure plate was inserted with three bicuspids on each side, so as exactly to fill the space of the lost teeth, and long enough to prevent contact of the upper and lower front teeth, by obviating the forward motion of the lower jaw, as also of the remaining upper molars. At first "all went merry as a marriage bell," the suction perfect, no more abrasion; but soon the part of the plate upon the outer alveolar ridge began to irritate the membrane; it had to be cut down, until finally nothing remained of it; it was then discovered that the suction was becoming weak, and the anterior teeth again approached within dangerous proximity. The force of mastication had spread the plate laterally, and the thing was a failure.

Gold fillings were then inserted in carious cavities properly enlarged in the second lower and upper molars, so as to raise their grinding surfaces considerably; the plate was then readjusted, so as to leave a space of about a line between the anterior teeth when the jaws were closed. About a year afterwards it was found that the front teeth were again beginning to touch, and that the outer cusps of the first lower bicuspids, as well as the upper canines, had become considerably abraded, these teeth having been thrown in apposition by the change in the articulation. Cavities were formed in the gold fillings in the upper molars, and their surfaces raised so as again to throw the jaws apart. The lower bicuspids, which were getting somewhat sensitive, had cavities formed in their abraded surfaces upon the outer cusps, and were built up so as very nearly to touch the antagonizing canines, after which these were reinforced with gold, so as to meet the bicuspids below. After these operations, it was found that the teeth upon the plate were too short, and the plate was again remodeled so as to make the antagonism perfect from the first bicuspid to the last molar. It is nearly a year since then, and the operation is apparently a success.

Erosion

closely resembles abrasion in its morbid anatomy; but its pathology is very much enshrouded in darkness. It differs from abrasion in that the localities of its occurrence almost invariably preclude even a possibility of mechanical exciting causes. From caries it differs, in that it is almost exclusively confined to the labial and buccal surfaces, very rarely attacking the cutting edges of the incisors; that it is not symmetrical in its occurrence; and the most marked difference is that, while a carious location always contains more or less disintegrating or decomposing substance, there never is anything of the kind perceptible, either by touch or vision, in localities affected by erosion; but these always present a highly-polished appearing surface, and the difficulty is generally manifested by the formation of transverse grooves upon the enamel near its cervical terminus, and occasionally by blotches upon the surface like those made with a scraper.

The etiology of this disease has been a stumbling-block in the researches of nearly all authors. Thus, Mr. John Tomes believes it to be of strictly mechanical origin; Garretson, a disease of predisposition, the result of impressions at the period of enamel formation; Fox looks to the saliva and friction of the lips for its cause; Hunter thinks it a disease inherent in the tooth, and not dependent on circumstances in after-life; Bell ascribes it to mechanical agencies, upon certain, from some cause predisposed, circular depositions of enamel; Harris believed an acidulated buccal mucus the cause; Taft, while not advancing any theory, inclines to the opinion that some secretion of acidulated buccal mucus is instrumental, and that the difficulty may be controlled by constitutional treatment, but does not indicate wherein this should exist. In an article from the German, which appeared in the August number of the *Missouri Dental Journal* for last year, the author suggests that the disease may consist of an analogous process to that of the resorption of the roots of the deciduous teeth, by a fluid secreted at the margins of the gums, in combination with a predisposition in the teeth concerned.

Still another authority, Dr. Nuhn, accounts for erosion upon the cutting edge of the front teeth by the secretion of an, in certain diatheses, acidulated mucus, secreted by a gland discovered in the tip of the tongue. Professor Wedl says "the fact that such defects never occur upon the lingual surfaces of the neck indicates that their cause is to be sought for upon the facial side. Sometimes the mucous membrane of cheeks and lips is raised into a fold opposite the dental arches. In many cases there is a tendinous expansion upon the facial surfaces of the gums of the lower jaw, which gradually becomes narrower, and terminates with a ridge of connective tissue, which is attached to the neck of a bicuspid or molar tooth. It may be well to consider in future cases whether any relation exists between the defects upon the neck of the tooth and these folds or ridges."

Among these many theories, that of Mr. John Tomes no doubt is the most astonishing, and we can hardly understand how so astute an observer as he could be led to say, "In the many cases that have come under my own notice, I do not think that a single example has presented itself in which the grooving could not be attributed to the action of the tooth-brush or to mechanical action in some form," except on the hypothesis that he had in view another form of disease. In cases where the cementum has become exposed by a recession of the gums, we frequently find a softening of this and the dentine, which may become the seat of caries. This altered tissue the use of a stiff tooth-brush or gritty tooth-powder may be instrumental in removing, and form into a groove, which ultimately may extend to and undermine the enamel; but such cases are not the ones now under consideration, as erosion primarily attacks the enamel.

In this respect it afforded me much pleasure, upon referring to a recent revision of the work by Mr. Charles S. Tomes, to find an entirely new chapter on erosion, in which the reviser speaks of a condition of the teeth closely simulating the appearance produced by mechanical abrasion, caused by the friction of the tooth-brush, and which now and then attacks teeth in localities not accessible to a tooth-brush. He figures a case of a canine, with the grooves extending back on both sides of the neck of the tooth, and distinctly undercut; also two incisors, with erosion upon the lingual surfaces of the crown. He also states having observed it in a patient who rarely or never resorted to the use of a tooth-brush. And as further proof that erosion does occur independent of mechanical abrasion, he cites the observation of Dr. Murie, who found that the teeth of a sea-lion (*Ottaria jubata*) had been thus wasted, and the places most affected were those least exposed to mechanical influences. He further states that this condition, in such an extreme, is not common, but that he has himself observed an approach to it in the teeth of other specimens of ottaria and in the proboscis seal. In summing up, Mr. Tomes says, "And it seems that we must fall back upon the idea that it is an example of chemical solution;" and further, "it seems probable that mucus, by fermenting or affording a nidus for fermentation, may provide an acid solvent."

Wherein predisposition to this disease may lie will be hard to determine. Any interruption to the nutrition during the formation of the teeth we would expect to see manifested upon contemporary teeth alike, and hence we should expect to see such attacked in like manner. But this is not the case. Yet we are very far from asserting that such predisposition does not exist.

Making this disease dependent upon an analogous process to absorption will probably not find many adherents, as it would be difficult to explain how this could be accomplished unless the vessels were always in contact with the tissues they are to absorb, which clearly is not the case,—as where the disease commences upon the enamel at a remote point from the gum.

At this time the most general belief undoubtedly is that the disease is a process of chemical dissolution.

In order to ascertain whether this generally-accepted theory of chemical decomposition can be practically demonstrated, or a like effect produced out of the mouth, we instituted a series of experiments, which, although they do not *prove* anything in this direction, as the conditions of extracted and living teeth are entirely dissimilar, may yet be of interest to be here stated, as they may be of service as a starting-point in further experiments.

We were fully aware that similar experiments had been instituted in investigations upon caries by Westcott, Allport, Mantegazza, Leber, Rottenstein, and Magitot, but the details of their procedures are not very accurately stated.

A number of anterior teeth, twelve of them of two twin sisters, aged about twenty years, were placed in solutions of the following-named acids and alkalies, of a strength of 1 to 32 of water, all of the acids being concentrated or glacial. The bottles containing the different substances were placed in a wooden box, and kept upon the top of a tin warming-oven attached to the back of a kitchen stove. In this way a very even temperature, of very little above blood-heat, was kept up during the day-time. The teeth were frequently removed from these solutions, and washed with a stiff brush transversely, and occasionally with a stiff polishing brush on a lathe, but no appearance similar to that of erosion could be produced, although in some cases, where a friable, calcareous mass remained, this was removed. The effect of the different substances was recorded at the end of each week, and is as follows:

EXPERIMENT 1.

Hydrochloric Acid.—First week. The cutting edges of tooth converted into a flexible feather edge; tooth very much reduced in size; very little enamel remains; cementum to the eye seems not acted upon, but the finger-nail entirely removes it.

Second week. Enamel entirely gone; dentine a mere stiff cartilage; tooth removed and placed in solution of caustic potassa.

Citric Acid.—First week. Action rather more decided than the hydrochloric acid, and of the same nature.

Second week. Tooth a flexible mass; placed in caustic potassa, with tooth from hydrochloric acid bottle.

Lactic Acid.—First week. The enamel is affected over its entire surface, being in appearance a chalky mass; brushing removes it partially, leaving a milky etched surface.

Second week. The enamel on cervical half of crown entirely gone; cementum only little softened.

Third week. Only a small portion of the enamel left upon the cusp of the tooth (a cuspid).

Valerianic Acid.—First week. No perceptible action.

Second week. Enamel on cutting edge etched (this was an abraded surface); anterior surface still glossy.

Third week. Whole surface of enamel chalky; cementum softened.

Acetic Acid.—First week. Action not perceptible on enamel.

Second week. Cementum softened; no action visible on enamel.

Third week. Somewhat etched on proximal and lingual surfaces; gloss still remains on labial surface.

Oxalic Acid.—First week. No visible action.

Second week. No action upon enamel, except a softening around carious locality. Root of tooth was exostosed, and this hypertrophy converted into a calcareous mass.

Third week. No action upon gloss of enamel.

Tannic Acid.—First week. No visible action.

Second week. No action, except that the tooth is getting brown.

Third week. No disintegration, but deep discoloration.

Eighth week. Tooth entirely black and rough over its entire surface.

Tartaric Acid.—First week. Enamel etched over its entire surface, presenting a crystalline surface, easily scraped off with a knife.

Second week. Etching deeper, with sparkling prisms; cementum slightly softened.

Third week. The etching still progresses.

Malic Acid.—First week. Action decided all over; cementum easily removed with finger-nail; enamel on outer surface chalky.

Third week. Enamel chalky, dentine softened.

Nitric Acid.—First week. Cementum very much softened; enamel around cervical border gone, dentine under it softened.

Second week. Very little enamel remains; tooth similar in appearance to that acted upon by citric and hydrochloric acids. The tooth was removed, and immersed in a solution of caustic potash of a strength of 1 to 480.

Uric Acid.—After four weeks, no action could be discovered, which was probably owing to the fact of its almost insolubility in even boiling water, ether or alcohol.

Sulphuric Acid.—First week. Enamel deeply disintegrated.

Second week. Nothing remains of the entire tooth; liquid is still acid, but of a milky appearance.

Carbolic Acid.—No action whatever can be discovered after four weeks' time.

Caustic Potassa.—Two teeth. After two weeks, no action could be discovered on either tooth. Teeth were removed, and placed one in the citric and the other in the hydrochloric acid bottles.

Bicarbonate of Soda.—After four weeks, no action could be discovered.

EXPERIMENT 2.

Caustic Potassa.—The teeth from the hydrochloric and citric acid of the first experiment were immersed into this, of a strength of 1 to 32, which had previously contained two teeth which had been distributed to the citric and hydrochloric acids. After two weeks, no solid substance remained of the tooth that had been acted upon by the citric, and only a very small portion of the root of that from the hydrochloric acid remained.

The tooth from nitric acid, after one week's maceration in a solution of caustic potassa of a strength of 1 to 480, was considerably diminished in size, showing action upon the cartilaginous substance.

Citric Acid.—One of the teeth from the caustic potassa of the first experiment, immersed in the acid that had been used in the first experiment, after one week presented the appearance of a popped grain of corn; the pulpy matter being removed, showed under it a cartilaginous substance.

Second week. Appearance again as in first week; action much deeper; cartilage remains a little harder than in the first experiment.

Hydrochloric Acid.—The other tooth from caustic potash, after one week, showed no action on enamel, though the cementum was softened.

Second week. Enamel slightly acted upon, but not nearly in the same degree as that in the citric acid.

All of the agents after these experiments, which for convenience' sake have not been recorded beyond the time stated, as time has not effected any marked changes from those mentioned, gave still a decidedly acid or alkaline reaction, showing that their potency was not entirely neutralized, with the exception of uric acid, which does not react upon litmus.

But as it may be objected that these agents were all in a more concentrated form than they would under ordinary circumstances be apt to occur in the system, still a further experiment was instituted. In this the strength of the substances was 1 to 480, ten of the teeth coming from a lady between forty and fifty years of age. Surfaces were ground upon these so as to expose the dentine, with a fine emery wheel, and polished with a felt wheel. After three weeks' treatment in the same manner as in the other experiment, and daily removal of some of them for brushing, the result was as follows:

EXPERIMENT 3.

Tartaric Acid.—Same crystalline condition of enamel as in Experiment 1. Easily removed with finger-nail. Exposed dentine softened, as also cementum.

Sulphuric Acid.—A calcareous disintegration over entire surface of root and crown.

Butyric Acid.—Cementum easily shaved off with knife; no action visible on enamel or exposed dentine.

Hydrochloric Acid.—Cementum softened; enamel partially removed, and the remainder of a horny appearance, but not impressible with a knife. Exposed dentine apparently not affected.

Nitric Acid.—Action scarcely perceptible, with the exception of slight etching on the sides of the enamel; no action on exposed dentine.

Acetic Acid.—Cementum easily shaved with knife; no action on dentine or enamel perceptible.

Phosphoric Acid.—Cementum softened; no action perceptible on either enamel or dentine.

Citric Acid.—Two teeth—molar (from boy twelve years old) very slightly acted upon in all its tissues, so far as action of the knife is concerned, and very much bleached; bicuspid (of lady past forty),—no action whatever could be discerned.

Oxalic Acid.—The entire tooth very much acted upon, especially the dentine and cementum.

Lactic Acid.—Cementum very much softened; enamel somewhat chalky on outer surface; dentine apparently not affected.

Malic Acid.—Cementum can be shaved with the knife; gloss of enamel not affected; slight action of dentine.

Saccharated Pepsine.—A slight action upon the cementum perceptible by the use of knife. This was a saturated solution, the sugar of which had no doubt entered fermentation; it smelled like soured yeast, and the action was undoubtedly owing to this fact.

These results do not fully accord with those of the various authors mentioned, the most particular point of difference being in the action of acetic acid. Messrs. Westcott, Allport, and Mantegazza, and Leber and Rottenstein, found this agent very active upon the enamel, while in my experiments I failed to discover this, but find, as did Magitot, that it acts more particularly upon the cementum. I used the glacial acid. There are some other points of difference, but this is the most essential.

We find that all the organic acids act powerfully upon the enamel, with the exception of tannic and acetic,—and especially first upon the cervical and proximal surfaces.

Of all the acids tested, sulphuric acid alone in the strength of one to thirty-two destroyed the whole tooth-substance, leaving nothing but a granular sediment in the bottom of the vessel.

Citric acid and hydrochloric in the strong solution appear alike in the intensity of their action upon the first teeth placed in them, but after having decalcified one tooth, the former acted by far more powerfully on the second than the latter.

In the weaker solution citric acid was not nearly as active as some others, that did not compare with it in potency in the experiment with the stronger solutions.

Caustic potassa seemed harmless upon the healthy tooth-substance, either enamel, dentine, or cementum, and very little action was perceptible upon the carious substance; but after the teeth had been decalcified by maceration in hydrochloric and citric acids, it entirely destroyed the cartilaginous substance remaining, whereas teeth that are first macerated in the caustic and then in these acids will still retain their shape in a cartilaginous substance. Is not this proof that alkalies are not primarily the cause of tooth destruction?

In the weaker solutions, the dentine, in teeth which had been ground so as to expose it, was acted upon more than the enamel only by malic and oxalic acids; otherwise the action was either not in excess of that upon the enamel, or none at all.

None of the acids or alkalies in either experiment produced an appearance similar to erosion or caries, and, with the exception of the strong solution of oxalic acid and caustic potassa, no deterioration around carious localities could be discovered, beyond that upon the healthy tissues.

Undoubtedly microscopic sections of the teeth so macerated may reveal to us some facts that the eye, only weakly aided as in these experiments, did not perceive.

The fact that no similar appearance to erosion can be artificially produced by the action of chemical agents with the addition of such mechanical force as the teeth could be subjected to in the mouth, would lead us to doubt the entire correctness of either the purely chemical or mechanical theories as to its origin, and we are hence much more inclined to the opinion that some truly pathological condition, either congenital or acquired, is a predisposing cause, which is aided and abetted by the chemical reagents and perhaps mechanical means.

Yet, even admitting that chemical dissolution is the sole cause of the difficulty, its pathology is by no means explained. It remains still to be seen whether particular constitutional conditions, and consequently defective nutrition, are concomitants of it, and how certain teeth should become thus acted upon and not others.

We still want to learn whether the dissolution is brought about by a secretion of the mucous membrane at its gingival margin, or from its labial or buccal portion; or whether the solvent is obtained from the saliva or derived from the food, either as such or by fermentation in the mouth; or some of these, or all combined; or whether certain mucous follicles may secrete acidulated mucus and not others, so as to act upon the particular localities of individual teeth in contact with them and no others; and under what circumstances these secretions are made active; and finally, after having fully ascertained all these points, we want to know what prophylactics to employ.

It is somewhat singular that, so far as known, no attempts have ever been made to demonstrate the many theories advanced, unless the annexed extracts from Leber and Rottenstein's recent work on *Dental Caries* may be considered as such. Certainly this disease offers a large field for investigation, and it is hoped that those versed in histology and the use of the microscope will endeavor to give us a satisfactory solution by actual research and experiment.

Leber and Rottenstein describe a *form of caries* which attacks the necks of the teeth, and forms there a smooth gutter-like furrow. In two cases examined by them anatomically, in a longitudinal section, they found, in one case, proceeding from the gutter, only a feeble trace of a brownish cone looking towards the pulp cavity, for which reason the changes which precede the caries of the dentine extended to but a slight depth, and were not marked. The density of the dentine was but little less than normal; there was, just below the surface, a slightly marked brownish shade. Under the microscope, they observed in this superficial layer, as usual, the dentinal canals filled with leptothrix. In the other case, a vertical section presented the form of a triangle, with its base turned outwards and its vertex towards the cavity of the pulp. On the lower side of this triangle there appeared a brownish cone directed towards the pulp cavity. Upon the interior surface of the pulp cavity, at the place corresponding to the gutter without, there was found at the extremity of the brownish cone a projection formed of dentinal substance of new formation, which had penetrated the pulp cavity to some depth.

In this observation it was evident that the caries was of a very slow progress, but had, notwithstanding, all the essential characters of this affection. And further on they say: "To explain, therefore, the polish of the surface, we can invoke only the action of the brush and the friction of the lips and of the tongue." Still further they say: "If we consider isolated facts of this kind we feel little disposed to take the phenomena for symptoms of veritable caries; but by analogy with other facts, where the nature of the caries is shown, we are compelled to admit equally for these exceptional cases that we have to do with a caries whose progress is very slow, which for a time may be really stationary, and afterwards take on new life under the influence of favorable cause." And again they say: "It would appear that the cause of this caries is the denudation of the neck by the absence of the gum. Upon the slightly rough surface of the cement, fermenting mucus and fragments of food are more easily deposited, and these same agents fixed between the gums and the neck of the tooth, are less easily removed. It may then happen in cases where the injurious causes are weak, or the teeth of a special hardness, that it is just the necks of the teeth which are more likely to be affected" In reference to erosion upon the cutting edges, they observe: "For want of sufficient observation, it is not possible for us to say if these morbid phenomena belong or not to caries. The form of the wasting does not permit us to attribute it to mechanical action."

It does not appear from the above that the cases investigated by them are such as in this paper are designated as erosion, as this occurs primarily upon the enamel.

As we do not know the causes of this disease, no dogmatical treatment can be pursued, but, on the hypothesis that acids are the active agents in dissolving the enamel, an antacid locally applied certainly can do no harm; and allowing that mechanical forces are the means of removing the changing tissues, the transverse use of the tooth-brush should be avoided. Mr. Charles S. Tomes recommends soft tooth-brushes and alkaline dentrifices.

Perhaps it might not be bad practice to follow out the hints contained in "Garretson" and "Taft" upon constitutional treatment. Prof. Garretson is in the habit of administering the lime tonics. We would suggest the trial of the syrup of the lacto-phosphate of lime.

When the disease has already progressed to some depth, the lost part should be restored artificially. And it would be safer to expose an entirely new surface before attempting to fill, just as we would do in a carious cavity before introducing the filling. Mr. Charles Tomes says that for the arrest of the progress of this malady by filling, gutta percha is often found exceedingly efficient.

In cases of erosion of the cutting edges of the incisors, which must of course affect speech, a liberal cutting away and replacement of the lost portion by gold or artificial tooth crown would, no doubt, be correct treatment.

Let us not be forever content to say, when speaking of the causes of erosion, "I don't know;" but let us observe closely all such cases, and record them, their history, temperament and habits of patient, condition of teeth generally, of secretion, and any other fact that may be worthy of note. If all these recorded cases are then compared, some facts may be evolved that, if each of us were confined simply to his own observation, we would never know.

PATHOLOGY OF CARIES.

(Thesis submitted to the Faculty of the Philadelphia Dental College, for the degree of Doctor of Dental Surgery.)

BY S E. KNOWLES, M.D., OF CALIFORNIA.

In order to appreciate morbid phenomena, it is necessary for us to be thoroughly acquainted with the condition of the parts involved while still within the bounds of health, for it is by the changes they have assumed in their departure from the normal state that we recognize disease: which is a condition in which sufficient anatomical or functional change has taken place as to interfere with the performance of the special function of the organ so affected. Any possible grade may be present, from the almost unrecognizable, to complete destruction; in the primary stages, a return to the normal being possible. Later on, death and disintegration are inevitable.

In this paper I shall endeavor to point out the close relation existing between the condition known as inflammation and the phenomena exhibited in a case of caries. I will therefore inquire briefly into the anatomy and physiology of dentine and enamel; note the symptoms of a case of caries, and compare with those of inflammation. The dentine is the most abundant of the tooth structures; it ranks in density next to enamel, and contains about seventy-two per cent. of earthy matter; it consists of an infinite number of tubuli and the intertubular substance, which is dense and granular. The tubuli are wavy in their course; they extend from the periphery of the dentine to the nearest border of the pulp-chamber, and average about the one ten-thousandth of an inch in diameter. They frequently divide in their course, anastomose with each other, and with the canaliculi of the cementum. This is an evidence of their permeability. From the pulp, along the tubuli, pass fibrillæ, which perform the function of nerves, and like them are most sensitive at their peripheral terminations. The tubuli also probably transmit nutrient fluids, but are not of sufficient caliber to admit the blood-corpuscles. The intertubular substance consists of fine granules, is transparent, and forms the bond of union of the tubuli. The enamel is developed by the enamel membrane, or more properly speaking, the enamel organ, and is deposited from within outward. It is composed of hexagonal fibers, radiating in a direction parallel with the tubuli; it contains but three per cent. of animal matter, and is without doubt totally devoid of vitality, as the following facts indicate. There is an entire want of sensibility; no evidence of molecular waste or repair; the small per cent. of animal matter; the want of structural modification after all possible means for supply have been cut off; the analogy existing between it and the superficial layer of the entire body and cavities in communication with the exterior. There is not a single instance throughout the entire human organization in which a living structure is exposed directly to the action of external agents; in case of removal of the epithelium or epidermis, nature at once replaces it. If the deeper parts be exposed, the first step taken is to cover it up, to protect the parts from absolute contact; for so long as even common air is allowed to come in contact with living tissue, repair is impossible. If then we admit the vitality of the dentine and the non-vitality of the enamel, the analogy is complete. The method of union of enamel and dentine is well known,—the hexagonal ends interlocking with the dentine,—and upon their immediate coalescence depends the future stability of the dentine.

By the term inflammation, we understand a condition in which there is local disturbance of nutrition accompanied by irritation, the presence of an excess of organizable material, increased formative action, and increased structural disintegration,—the symptoms, when possible, being swelling and redness with heat and pain. In the bones some of these symptoms are absent, and in the teeth still more; but this is owing to obstructions of an anatomical character, which render their manifestation impossible. A proper understanding of the true theory of caries depends upon what is understood by that term. If we only take into consideration the loss of dental tissue, the theory of chemical solution would be amply sufficient; but if we include *all* the changes that take place during the course of this disease, we must certainly look for something more than chemical solution.

In caries, the phenomena exhibited are easily determined, and their import as readily comprehended. The positions in which caries occurs is where the enamel is least abundant, and where chemical solvents are most liable to be generated and retained in contact with the enamel. Their action must be purely chemical, for they act upon a structure devoid of vitality; but after removal of the enamel has been effected, another force is brought to bear upon the parts. The dentine is now exposed, a living tissue,—vital only to a limited extent, it is true, but still sufficient to admit of the development of inflammation, for any tissue receiving nourishment and having sensation may take on this condition, anatomical and mechanical obstacles alone preventing full exhibition of all phenomena observed in the soft parts, swelling and redness being impossible, the heat imperceptible, but the pain being present. There *is* modification of nutrition, irritation, and increased structural disintegration, and, under favorable circumstances, the presence of an increased amount of organizable material and increased formative action. If a case of caries be allowed to proceed, the exposed surface inflames, dies, and a new surface is uncovered, which, being exposed to the same irritant, takes on the same degenerative action, nature not being able to interpose a barrier sufficiently potent to resist this tendency to disintegrate, except in isolated cases, and usually at a period of life when the tendency to deposit the salts of calcium is apparent throughout the entire economy. Generally a section of a carious tooth at the seat of disease shows a bright, dense band, destitute of tubuli, which is evidence of an effort on the part of nature to circumscribe and thus isolate a part which cannot be expelled from the economy.

In regard to treatment, I have nothing new to offer. The operation of filling, thoroughly performed, removes the source of irritation, and substitutes a gentle stimulant to the willing natural forces,—the result being a complete obliteration of the tubuli at the line of contact with the filling material, and thus establishing the normal relation of the parts,—that is, a layer of devitalized matter between the living tissues and the exterior. There are cases of death and final destruction of a tooth in which vitality is first suspended, and loss of form is then brought about by chemical and mechanical forces. This obtains whenever the pulp dies before the dentine is affected; such a tooth is not more liable to be attacked by chemical agents from without than before death, but is subjected only to the same laws that govern all dead tissues,—a tendency to disintegrate so long as the enamel remains perfect; but if, by any means, the dentine becomes exposed, the resistance offered by vitality is no longer present; its decomposition is therefore much more rapid. There is, first, death of the tooth, without the stage of inflammation, by the suspension of vascular supply and nervous stimulation, which only remove the vital forces. The change of form is then brought about by chemical and mechanical forces; but this is not true caries. From what has been brought forward we have—1. Enamel, not being vital, cannot inflame. 2. Dead teeth are not more liable to suffer from *decomposition* of the enamel than living. 3. Caries is always attended by inflammation. 4. The continued presence of an irritant is necessary, in order that caries may proceed; and the removal of all irritants arrests caries. 5. There is always present an effort of nature to arrest caries. 6. Chemical solvents act unequally on dead and living dentine; they act in inverse proportion to the density and vitality, and in direct proportion to the imperfection of anatomical structure of the dentine.

A PORTION OF A TOOTH DRAWN INTO THE BRONCHIAL TUBE,—PATIENT UNDER THE INFLUENCE OF NITROUS OXIDE GAS.

BY WILLIAM H. HERTZ, D.D.S., HAZLETON, PA.

(Read before the Odontographic Society of Pennsylvania.)

THOSE who in their practice administer nitrous oxide gas, may have serious as well as amusing and interesting experiences.

All anæsthetics may be more or less dangerous in themselves; yet while this particular one is undoubtedly the least so of those used, there is greater risk from the surroundings than the gas. If the string is not of sufficient strength or securely attached, the cork may become dislodged, or a tooth or other foreign body might fall into the throat and be drawn into the larynx, eventuating in serious disturbance, if not in actual death. Such accidents are of course more liable to occur in the case of nervous and excitable patients.

A case occurred in my practice, July 28th, 1872, which was quite serious, and nearly ended fatally. Thinking it might be of interest to the profession, it has been suggested to bring the facts before this association.

Miss L———, aged about twenty-six, called to have the inferior right second molar extracted. The cork or prop was placed in position, and the gas administered. The nervousness of the patient was very apparent—so much so, that it was only by the greatest efforts that she was retained in the chair.

In her struggles the crown of the tooth was broken, and we apparently heard the broken tooth drop from the mouth into the spittoon. I thought that part which had broken off was all ejected.

After inhaling the gas she felt perfectly well, but could taste it for three days. Immediately after the operation she coughed continually, and in two weeks much soreness of the lungs was felt. She expressed the feeling to be as if her whole lungs were coming out when in the act of coughing.

She felt perfectly well after the paroxysms, but thought she could feel something going back in the air tubes. The left lung did not feel sore until the fifth week. Leaning forward with her hands to her head gave relief. The last two weeks she was so weakened as to be confined to bed, but never for one hour could she lay her head upon the pillow during the five weeks that she suffered.

She was treated two weeks by a physician; the remedies employed, however, gave no relief from the cough. He tried to keep her under morphine, but with little or no effect. A second physician was consulted, and succeeded in relieving the distressing sensation to a certain degree. At the end of the fifth week to within a few hours she succeeded—after a violent fit of coughing—in bringing up a piece of the crown of the tooth.

Her second medical adviser treated her for consumption, and most of her acquaintances thought it was a case of "quick consumption."

After expelling the source of annoyance she felt quite well; her health is now good, the only inconvenience felt is upon taking a long breath, producing a pain something like needles in her side, and a little soreness when pressing her hand on the right breast.

I submit with this the portion of tooth which was the cause of this cough. The patient said as soon as the piece was coughed out she was another person in feeling.

I may add that I had administered the gas several times previously to the patient, and she was always very nervous.

PROCEEDINGS OF DENTAL SOCIETIES.

SUSQUEHANNA DENTAL ASSOCIATION.

The stated annual meeting of this association was held in Wilkesbarre, May 14th, 1873.

The President, Dr. H. H. Martin, in the chair.

After some preliminary business, Dr. Martin, Committee on Legislation, reported that he had labored earnestly and hard, spending considerable time, to procure the passage of an act regulating the practice of dentistry in this Commonwealth, but as yet had not succeeded.

Question Box. At what age do patients' teeth require the greatest care? After a general discussion, the conclusion arrived at seemed to be that patients during childhood required the greatest care, and that if the proper attention was then given to them, the necessity would gradually lessen as age advances.

Question 2d. Has any one present used the Electric Burring Engine? and if so, with what success?

Drs. Klump and Newell have used it, and like it very much; think it is all it is recommended.

Question 3d. What is the best mode of educating the public to a proper discrimination in dentistry?

Dr. Martin. Each dentist should teach his own patients while in the chair, and on all available occasions.

Dr. Klump thought that was all very necessary, but thought some other mode should be devised. We have too many teachers who teach and practice quackery.

Dr. Wingate. By writing dental literature for the newspaper, for school books, and even for Sunday-school books.

Question. What means shall we take to prevent men from entering the profession who do not intend to properly prepare themselves?

Dr. Dieffenbacher. By refusing to take a student who will not take a regular course at a dental college.

Dr. Barrett thought that was all we could do, besides requiring honesty, morality, and intelligence, as a passport into the profession.

Question. What is the best method of drying out nerve cavities?

Dr. Dieffenbacher used cotton wrapped around a nerve broach.

Dr. Wingate used lint and Japanese bibulous paper around the broach.

Dr. Williams used gilling twine and Japanese bibulous paper wrapped around the broach.

The reading of essays being next in order, Dr. Barrett responded with an essay on "Toothache."

Dr. Wingate read an essay on "The Dentists of the Day." He recommended educating the public by writing dental literature for the paper and the school; spoke of the growing liberality of practitioners in communicating any improvements to the profession at large, instead of having secrets, as they did twenty years ago.

The next business before the association being the discussion of the regular subject, "Contour Fillings," Prof. Atkinson was requested to give his views on the subject.

Professor Atkinson came here to talk. Contour filling means restoring the parts of a tooth lost to its original contour by filling; he has advocated it a long time. In 1859 there was an article published in the DENTAL COSMOS on this subject, which he had written ten years before. He would not fill teeth so full but that thread or floss-silk could be passed between them to cleanse them. Fillings must be well anchored, so that it will not be necessary to tell the patients to be careful in brushing the teeth and in using the tooth-pick, as he has heard of dentists doing. Fillings should be perfectly finished, so that the best magnifier can detect no shoulder nor roughness between the gold and tooth.

Dr. Beck. What about Dr. Arthur's system?

Dr. Atkinson. Wherever Dr. Arthur's method is useful, we can get along without it; and when we need it, it is a failure.

Dr. Beck had seen contour fillings a success, and had also seen contour fillings a failure; had a patient of Dr. Arthur's, whose teeth he considered badly filed. The patient at first objected to have them built out with gold, but when it was done she was delighted.

Dr. Beck. How would you fill two bicuspids which were in very close contact before decay?

Dr. Atkinson. Build them out full as designed by nature, and then patients must brush them. The upper teeth should be brushed downward, and the lower ones upward, from the roots towards the crown. The doctor here gave a description of a number of badly decayed teeth he filled for a Methodist bishop, charging fourteen hundred dollars; and of another patient whom he charged three thousand one hundred and forty dollars.

Don't fill the six-year molars, for a child under twelve years, with gold; use osteo-plastic, or the much-abused amalgam. Require all patients under fourteen years of age to come to your office once a month.

Dr. Crawford. What rules would you give in regard to lancing children's gums before the teeth appear?

Dr. Atkinson. Lance only when the gums are white or purpuric, or when white and hard, and then lance directly across the tooth.

Dr. Crawford. How would you treat children who have constitutional irritation from teething?

Dr. Atkinson. Hygienically.

The next subject for discussion, "Hemorrhage during Dental Operations," was opened by Dr. Dieffenbacher. He had a severe case of hemorrhagic diathesis, which was successfully treated by administering acetate of lead internally. The patient had danced the night before and the night following the operation. He has used persulphate of iron with success.

Dr. Beck had extracted a tooth after dinner, and the patient began to bleed the following night. He treated the case, and all others he had, successfully with tannic acid; removed first all the clot, and then packed cotton with tannic acid thoroughly into the cavity, and made compress with linen.

Dr. Atkinson. Bleeding is frequently caused by the artery being held by the bony walls of the socket so that it cannot contract. If a burr-drill or excavator is pushed down and turned around so as to detach it, the bleeding will cease at once. In the case related by Dr. Dieffenbacher, the bleeding was evidently caused by overtaxing the system so that there was not sufficient nerve-force.

Dr. Klump. Is there not sometimes a diseased condition of the blood-vessels, so that they will not contract even when not in contact with the walls of the socket?

Dr. Atkinson. Not unless in a very low state of the system.

Dr. Klump had never had any serious difficulty, but thought all should be prepared to act at once, and act intelligently, if called upon.

Anæmia is perhaps the greatest cause of hemorrhage. Typhoid and purpuric conditions are also met with. Each case should be constitutionally treated according to the vice. In anæmia, tinct. chlor. of iron should be given; must express his disapprobation of the use of persulphate of iron in dental hemorrhage: first, because it destroys tissue; and second, because the clot formed is soluble in the saliva, from which secondary hemorrhage is likely to result; and if it does result, the case is more complicated and dangerous than at first. Tannin makes a clot not soluble in the mouth, and will usually arrest hemorrhage, and will not destroy tissue like iron. Tinct. erigeron canadensis is highly recommended. Digitalis or veratrum viride is always indicated to lessen the action of the heart.

Dr. Wingate used a pellet of cotton dipped in creasote; plunges it through or alongside of the clot to the terminus of the root-cavity, withdrawing the instrument quickly. This albuminizes the blood and forms an insoluble clot, closing the orifice of the artery. He thinks packing the cavity has a tendency to cause much pain.

Dr. Williams used phénol sodique on cone-shaped cotton pledgets forced down into the socket.

Subject closed.

Dr. Williams. How do you keep Guillois's cement dry when cavities are large and teeth frail?

Dr. Missimer uses napkins or rubber dam to keep dry until the filling crystallizes; then covers with a solution of gutta-percha and chloroform to further protect from the fluids of the mouth until the hardening process is entirely completed.

Dr. Williams, after filling, slips French rubber-tubing over the tooth and filling, and lets it remain some time.

Dr. Martin uses the prepared gutta-percha.

Dr. Klump also uses the usual means to keep dry, but finds such filling become defective around the necks of the teeth near the gums, while the grinding surface remains good; some one has recommended filling the part of the cavity near the gum with gutta-percha or Hill's stopping, and the remainder with osteo-plastic. He thinks it a good suggestion.

Dr. Atkinson. When a filling is poor, you either have too much or too little water of crystallization; it does not crystallize alike, and a magnifier will show its defects. He has seen osteo-plastic fillings that were inserted fifteen years ago.

Dr. Wm. H. Hertz was elected to active membership. Drs. Atkinson, Welchens, and Newell were elected corresponding members.

On motion, the society requested the publication of Drs. Barrett's and Wingate's essays in the DENTAL COSMOS.

On Wednesday evening Dr. Beck gave the association an ovation at his residence.

The Executive Committee reported the following essayists: for semi-annual meeting, Drs. Missimer, Beck and Newell; for annual meeting, Drs. Williams, Sticker and Gerhart.

Subjects for discussion are—

1. Best gold for filling.
2. Treatment of teeth having exposed or nearly exposed pulps.
3. Diseases of the gums, and treatment for the same.

Dr. Wingate exhibited an instrument which he termed the depurator. This is a gum-cupping or leeching instrument, consisting of a rubber lip to attach to the gums, and a cup to which is attached an air-pump or exhauster. It is claimed that, with this, alveo-dental inflammation and even abscess can be cured.

Dr. E. C. Rishel, of White Haven, exhibited an ingenious contrivance for keeping the mouth open and the cheeks out of the way while operating on the posterior teeth. It met with special favor by those present.

The officers for the present year are—

President.—J. L. Fordham.

Vice-President.—W. H. Missimer.

Recording Secretary.—G. W. Klump.

Corresponding Secretary.—J. M. Barrett.

Treasurer.—D. Dieffenbacher.

Representatives to Pennsylvania State Dental Society: Drs. Beck, Missimer, Valentine, Renn, Bessac and Williams.

Representatives to American Dental Association: Drs. Richards, Fordham, Missimer, Sticker and Gerhart.

Executive Committee.—Drs. Beck, Gerhart and Martin.

Adjourned, to meet in Williamsport November 12th, 1873.

G. W. KLUMP. *Recording Secretary.*

CALIFORNIA STATE DENTAL ASSOCIATION.

The fourth annual session of the California State Dental Association convened in St. Andrew's Hall, San Francisco, May 20th, 1873. President, Wm. Dutch, D.D.S.

During the session, which continued four days, the following-named gentlemen were admitted to active membership: J. W. Winter, Alex. Warner, Jr., D.D.S., C. W. Richards, D. J. Tris, W. H. Stanley, J. B. Beers, T. H. Ferguson, D.D.S., C. H. Fuller, and A. B. Wood, of San Francisco; G. C. Hoadley, of San Jose; F. H. Hubbard, M.D., of Sacramento; J. J. Dyer, of Santa Cruz; D. N. Powers, of Oakland; and A. Cornwall, of Virginia City, Nevada.

Dr. O. S. Munson, E. S. Belden, M.D., of San Francisco, and B. S. Codman, of Boston, Mass., were admitted as honorary members.

Essays were read as follows: "Requisites of the Dentist," by W. J. Prather. "Circulation of the Blood," by H. Austin. "The Mouth, its Structure and Functions," by R. Cutlar. "Operative Dentistry," by J. N. Myers. "Causes and Treatment of Offensive Breath," by Max Sichel. "Dental Ethics," by F. E. Bunnell.

Reports were received from Drs. Menefee, McCowen and Bush, of Committee on Mechanical Dentistry; Dennis, on Operative Dentistry; and S. E. Knowles, on Dental Pathology and Surgery.

The Legislative Committee recommended a bill similar to the Ohio law, giving members of the profession now residents of the State two years to prepare for an examination. Report adopted, and committee instructed to use all legitimate means to secure its passage at the next session of the legislature.

The Revision Committee reported a revised constitution and by-laws, code of ethics, etc., which were adopted. The code of ethics is the same as that of the American Dental Association.

The Barnum Testimonial Committee accompanied their report with a magnificent testimonial, which will be presented to Dr. Barnum at the next session of the American Dental Association.

President Dutch, in his annual address, said: "It is evident to us all that we need on the Pacific coast a school of instruction for those who would qualify themselves for the practice of dentistry: a school where the science and the art, the theory and the practice of dentistry may be acquired, and the power of publishing to the world, as an authority to be respected, the proficiency of those who have been thoroughly taught, as by the giving of diplomas." He also recommended the selection of *eight* members who might be deemed the best qualified, and "who were willing to take upon themselves such a responsibility, requesting them to organize from among themselves, as far as they can, a Dental College, affiliating with the University of

California or some other city organization, for the purpose of conferring the degree of D.D.S. Or, failing in such satisfactory affiliation, then asking the legislature to confer the power on the college itself, and that you give such an organization all the support you can, individually and collectively."

Professor Gilman, President of the University of California, having been invited, addressed the association on the above subject. He spoke of the University as an "institution of learning established by the State on foundations which were laid by private devotions in the days of Argonauts, who believed in the wisdom which was better than gold. It has been endowed by the National Government with munificent land-grants, and received from the State generous donations and a comprehensive charter. It is a university of the nineteenth century, open without money and without price to students of every State and country, designed to promote the efficiency of every branch of liberal culture." He would be glad if, in the organization of a Dental School in connection with the University, they could rely upon the co-operation and help of the California State Dental Association. All the authorities of the University would rejoice at suggestions and help and counsel from every member of this society.

A committee of five was appointed to confer with the Board of Regents relative to the matter, and further consideration of it was made a special order for 10.30 A.M. next day; when the Advisory Committee reported the following resolutions, which were unanimously adopted:

Resolved, That this association receives with unqualified satisfaction the assurances that our most cherished hopes are to be realized through the wisdom and liberality of the Board of Regents of the California University, in their proposed establishment of a Dental College.

Resolved, That we approve of and recommend the following curriculum of instruction in the College: 1. General Anatomy and Surgery; 2. Physiology; 3. Materia Medica and Therapeutics; 4. Chemistry and Toxicology; 5. Mechanical Dentistry and Metallurgy; 6. Institutes of Dental Science; 7. Special Anatomy and Surgery; 8. Operative Dentistry and Pathology; 9. Demonstrator of Operative Dentistry; 10. Demonstrator of Mechanical Dentistry; 11. Course of Clinical Lectures; 12. Board of Examiners.

Resolved, That the association indorse and recommend the following-named eight gentlemen as proper persons to fill the special chairs above designated: Drs. Wm. Dutch, S. W. Dennis, C. C. Knowles, H. E. Knox, W. J. Younger, S. E. Knowles, H. Austin, and J. J. Menefee.

Resolved, That an Advisory Committee of five be appointed, and empowered to act with the Advisory Committee of the Board of Regents in carrying into effect all necessary details of the organization.

The President appointed Drs. Cutlar, Lundborg, Birge, Bunnell, and Cogswell to act as an Advisory Committee.

Clinics were given during the session by Drs. Dennis, Knowles, Knox, and Younger.

The several reports and essays were thoroughly discussed, and, as soon as published, each dental journal will be furnished with a copy, so that they can select therefrom any matter they may deem new or important to their readers and the profession generally.

The following were elected officers for the ensuing year:

President.—Dr. C. C. Knowles, San Francisco.

Vice-President.—Dr. J. J. Menefee, San Jose.

Secretary.—Dr. H. J. Plomteaux, Woodland.

Corresponding Secretary.—Dr. Henry E. Knox, San Francisco.

Treasurer.—Dr. H. Austin, San Francisco.

Librarian.—Dr. J. J. Birge, San Francisco.

Standing Committees were appointed on Dental Pathology and Surgery, Dental Therapeutics, Dental Chemistry, Operative Dentistry, Mechanical Dentistry, Dental Histology and Microscopy, Dental Literature and Education, Publication, and an Executive Committee.

The President made the following assignments of theses:

"An Inquiry into the Causes and Treatment of Degeneracy of Children's Teeth." Dr. D. M. Hughes.

"The Secretions of the Mouth, considered in their Normal and Abnormal Characteristics." T. H. Ferguson, D.D.S.

"Pregnancy as affecting the Teeth." A. Cornwall.

"The Inter-relations of Dentistry and Medicine." J. A. Lundborg.

"Extraction of Teeth." F. M. Shields.

"Dental Education." H. J. Plomteaux.

Resolutions appropriate to the memory of Dr. E. O. Belle, deceased since our last annual session, were reported, and adopted by a standing vote. The session lasted four days, and, with short intermissions, was at work from 10 o'clock A.M. until 10 o'clock P.M.

The next annual session will be held in San Francisco, commencing on the second Tuesday in June, 1874, at 10 o'clock A.M.

H. J. PLOMTEAUX, *Secretary.*

NEW JERSEY STATE DENTAL SOCIETY.

THE third annual meeting of the New Jersey State Dental Society was held at Long Branch, July 8th, 1873, at one o'clock, and continued its session three days. The attendance was rather fuller than usual, and the meeting interesting and instructive.

The following are the newly-elected members: Drs. T. W. Dobbins, R. W. Farr, Oscar Adelberg, Jas. C. Clark, A. G. Freeman, E. M. Beesley and Harry Burnette.

The election of officers for the ensuing year resulted as follows:

President.—Dr. John W. Cosad, of Jersey City.

Vice-President.—Dr. L. H. DeLange, of Bordentown.

Corresponding and Recording Secretary.—Dr. J. W. Scarborough, of Lambertville.

Treasurer.—Dr. Geo. C. Brown, of Mount Holly.

Executive Committee.—Drs. Worthington Pinney, James F. Fowler, and C. S. Stockton, of Newark; E. F. Hanks, of Jersey City; and Chas. Dipple, of Trenton.

Dr. DeLange, on behalf of the committee appointed to procure legislative enactments to incorporate the society, and regulate the practice of dentistry in the State, and to protect the public from empiricism, reported the work accomplished, and produced certified copies of the law; and the following-named gentlemen were appointed a Board of Examiners under its provisions: Drs. C. S. Stockton, of Newark; J. Hayhurst, of Lambertville; L. H. DeLange, of Bordentown; Louis Reading, of Trenton; D. C. McNaughton, of Jersey City.

An evening session was held on Wednesday, to consider the rubber question.

Dr. Jack, of Philadelphia, being present on invitation, fully explained the situation, after which the following resolution was passed, as expressive of the sense of the meeting:

Resolved, That the New Jersey State Dental Society exert itself, by all honorable means, to raise funds for the purpose of ascertaining the rights of the dental profession in regard to patents.

A committee was appointed to prepare and send out to the entire profession in the State a circular embodying these views.

Interesting clinics were held by Drs. Abbot, Jack, and Pinney.

Votes of thanks were given to Dr. Frank Abbot, of New York, and to Dr. Jack, of Philadelphia, for the valuable assistance they rendered during the session; and to Dr. S. S. White, for the stand he has taken in defense of the rights of the profession against unjust demands made under fraudulent patents.

Dr. Stevens was appointed demonstrator for the next annual meeting, to be held at Mount Holly, the second Tuesday in July, 1874.

Adjourned.

J. W. SCARBOROUGH,
Recording and Corresponding Secretary.

MINNESOTA STATE DENTAL ASSOCIATION.

THE second annual meeting was held at Pomeroy's Hall, Minneapolis, Dr. D. C. Price presiding, and about thirty members being in attendance.

An interesting address, congratulatory and historical, was delivered by the President.

New members were elected as follows: L. Townsend, Wabasha;

W. F. Lewis, Winona; Geo. E. Miller, Rochester; E. R. Jaques, St. Cloud; Frank A. Williamson, Red Wing; J. C. Currier, Mankato; L. W. Lyon, St. Paul; Archie Bamber, Rochester.

Essays were read as follows:

By Dr. M. D. Patterson, on "Mechanical Dentistry;" by Dr. A. L. Bausman, on the "Dental Profession;" by Dr. M. D. Stoneman, on "Quackery;" by Dr. J. B. Bowman, on "Dental Fees;" by Dr. Bryant, on "Substitutes for Artificial Dentures;" by Dr. Miller, of Rochester, on "Dental Societies."

The application of the "rubber dam" in difficult cases was illustrated by Dr. J. C. Merritt. Dr. Stoneman described his "amalgam positor."

Officers for the ensuing year were elected as follows:

President.—Dr. J. A. Bowman, Minneapolis.

Vice-President.—Dr. B. G. Merry, of Stillwater.

Secretary.—Dr. C. DeMontreville, of St. Paul.

Treasurer.—Dr. S. A. Beecher, of St. Paul.

The next annual meeting will be held at Faribault, on the last Wednesday in June, 1874.

Dr. Bryant introduced resolutions asking legislative protection of the practice of dentistry, which were referred to a committee consisting of Drs. Bryant, Merritt, Glidden, Calking and Bausman.

NEW YORK STATE DENTAL SOCIETY.

The Dental Society of the State of New York met at Albany, June 23d.

The annual address was delivered by the President, Dr. C. A. Marvin.

Appropriate resolutions, submitted by Dr. G. W. Tripp, were adopted in reference to the death of Dr. Philip Harris, of Skaneateles.

A vote of thanks was unanimously adopted, thanking Dr. S. S. White, of Philadelphia, for his services in behalf of the profession, in the matter of the Goodyear Dental Vulcanite Company.

Officers for the ensuing year were elected as follows:

President.—Dr. J. G. Ambler.

Vice-President.—Dr. A. M. Holmes.

Secretary.—Dr. Charles Barnes.

Treasurer.—Dr. A. C. Hawes.

Corresponding Secretary.—Dr. S. A. Freeman.

Censors.—Drs. N. W. Kingsley, C. A. Marvin, F. French.

Delegates to American Association.—Drs. Ambler, McCall, Hitchcock, Brockway, and French.

Delegates to Ontario Association.—Drs. Barrett and Daboll.

Delegate to Pennsylvania Association.—Dr. J. G. Ambler.

Adjourned *sine die.*

PENNSYLVANIA STATE DENTAL SOCIETY.

THE fifth annual meeting of the Pennsylvania State Dental Society was held at the City of Lancaster, July 8th, 1873.

A full representation of the membership was in attendance during the session, and a great number of delegates from local societies were admitted as permanent members, and participated in the proceedings.

A number of highly creditable and scientific papers were read and duly discussed, which formed the most interesting and instructive part of the meeting.

The officers for the ensuing year were elected as follows:

President.—Dr. G. W. Klump, Williamsport.

First Vice-President.—Dr. Wm. N. Amer, Lancaster.

Second Vice-President.—Dr. Robert Huey, Philadelphia.

Recording Secretary.—Dr. R. H. Moffit, Harrisburg.

Assistant Recording Secretary.—Dr. J. G. Weltmer, Litiz.

Corresponding Secretary.—Dr. W. H. Scholl, Reading.

Treasurer.—Dr. John McCalla, Lancaster.

After a very profitable and interesting meeting of three days' duration, the society adjourned to meet at Wilkesbarre, the second Tuesday of July, 1874.

S. WELCHENS, *Corresponding Secretary.*

OREGON STATE DENTAL SOCIETY.

THE several members of the dental profession throughout Oregon, having long felt the need of a State organization that would permit them to keep pace with and reap the same benefits as their eastern brethren, met in Portland on March 29th, and organized a State Dental Society, electing the following officers:

President.—Dr. J. H. Hatch, Portland.

Vice-President.—Dr. L. S. Skiff, Salem.

Corresponding Secretary.—Dr. Wm. F. Thompson, Portland.

Recording Secretary.—Dr. J. R. Cardwell, Portland.

Treasurer.—Dr. J. Welsh, Portland.

The following persons signed the Constitution and By-Laws: Drs. J. H. Hatch, L. S. Skiff, Wm. F. Thompson, John Welch, George H. Chance, T. L. Nicklin, George W. Gray, J. R. Cardwell, and E. Biddle.

A very interesting paper was read by Dr. Chance, on "Gold-pointed Instruments as Pluggers;" explaining their superior merit over steel.

The subject was taken up and fully discussed by the members present.

Clinics were held by Dr. Thompson. Various subjects were discussed, and the society adjourned to meet in Salem on the last Wednesday of June.

CONNECTICUT STATE DENTAL ASSOCIATION.

The Connecticut State Dental Association held its ninth annual meeting at Hartford, May 20th and 21st.

The following officers were elected to serve during the year:

President.—Dr. R. C. Dunham, New Britain.

Vice-President.—Dr. L. Parmele, Hartford.

Recording Secretary.—Dr. Davis E. Lane, Hartford.

Corresponding Secretary.—Dr. Daniel Dwyer, Hartford.

Treasurer.—Dr. E. E. Crofoot, Hartford.

Executive Committee.—Drs. Sage, Scranton and Strang.

The retiring President, Dr. Woolworth, read a paper entitled, "Dignity as a Necessary Qualification for a Dentist." The association extended to Dr. Woolworth a vote of thanks; also voted that it should be sent to the Dental Cosmos for publication.

Davis E. Lane, *Secretary.*

EDITORIAL.

We had hoped to present in this number of the Dental Cosmos reports of the proceedings of the Southern and American Dental Associations, and Convention, but they have not been received according to expectation. We propose their publication in the next number.

We must again ask the indulgence of contributors for the non-appearance of their articles. A variety of matter already in type we have been compelled, for want of space, to lay over.

OBITUARY.

DR. AMOS WESTCOTT.

At a meeting of the dentists of Syracuse, held at the office of Dr. Charles Barnes, for the purpose of taking suitable action relative to the loss the dental profession has sustained in the sudden demise of Dr. Amos Westcott:

Dr. James Chandler was elected Chairman, and Dr. F. D. Nellis, Secretary.

Drs. S. C. Dayan, S. B. Palmer and Chas. Chandler were appointed a committee on resolutions, when the following preamble and resolutions were submitted for consideration, and unanimously adopted:

Whereas, a mysterious Providence has removed from our midst Amos Westcott, M.D., D.D.S., one of the oldest dentists of this city; therefore, *Resolved,* That in the death of Dr. Westcott, the profession of dentistry has lost one of its foremost members,—one who has done as much as any member of the profession to promote its advancement and growth,—who, both as a writer and teacher, instilled into the minds of students the most valuable principles of our practice, the beneficial effects of which are as extensive as civilization itself, and whose name is honored by dentists throughout the world.

Resolved, That while we testify to the pre-eminence enjoyed by the deceased in the dental profession, we bear witness with equal emphasis to his worth and uprightness as a man. Genial in manner, he always stood ready to assist, by his counsel, those who were struggling upwards, taking a deep interest in the welfare of his fellow-men, and especially of the city of his adoption.

Resolved, That we deeply sympathize with the afflicted family in their sad bereavement.

Resolved, That, as a further mark of respect, we, the dentists of Syracuse, attend the funeral of the deceased in a body.

Resolved, That a copy of these resolutions be transmitted to the family of the deceased, and that the same be published in the daily papers of this city and in the leading dental journals of the country.

F. D. NELLIS, *Secretary.*

S. B. H. FAUGHT, D.D.S.

WITH sincere and deep regret I announce to the alumni and students of the Philadelphia Dental College the death of S. B. H. Faught, D.D.S., who died July 21st, 1873, of consumption. He entered with me as a private student in the fall of 1870, and from that time on applied himself with untiring industry and perseverance to his studies, and to the acquirement of a practical knowledge of the profession. Of the many students who have come under my direct care or observation, I can recall none who have manifested greater devotion, or a more earnest desire to master the principles and practice of the profession. Possessing keen perceptions, a retentive memory, and a logical cast of mind, these, combined with his persistent industry, enabled him to gain knowledge rapidly. In addition to this, while a boy he had acquired a taste for mechanics from his father (a skillful machinist, and superintendent of a large manufacturing establishment), and manifested considerable ingenuity and manipulative dexterity in operative and mechanical dentistry. Having attended three full courses of lectures in the Philadelphia Dental College, his examination for the degree of Doctor of Dental Surgery by the Faculty at the close of the last session was of the most satisfactory and creditable character, securing for him the highest average. Although unknown to the world at large, his premature death will be regarded by all who knew him as a loss to the dental profession. With a cultivated mind, an amiable nature, pure and elevated aspirations, had he lived and enjoyed health he would, without doubt, have rendered valuable service to the community and the profession of his choice. J. H. McQ.

CORRESPONDENCE.

THE AMERICAN DENTAL SOCIETY OF EUROPE.

On the 4th of July, 1873, a few enthusiastic American dentists of Switzerland met at Lucerne, and made the trip of the Rigi; and while on the little steamboat, on the lovely lake, surrounded by the frowning Pilatus, the stately Rigi, and the snow-capped Alps, discussed the plan of establishing an "American Dental Society of Europe."

The object of the meeting had been to celebrate the Fourth, and "talk" about founding a society. The "talk" was simply earnest and confident determination to form the first "American Dental Society of Europe," and when the top of the Rigi was reached, all that was necessary was to elect officers for the year, and resolve to devote our energies to the object.

The above name was given to the society, and the following officers elected:

President.—Dr. C. T. Terry, of Zurich.
Vice-President.—Dr. J. G. Van Marter, of Basel.
Recording Secretary.—Dr. C. M. Wright, of Basel.
Corresponding Secretary.—Dr. N. W. Williams, of Geneva.
Treasurer.—Dr. G. W. Fields, of Geneva.
Executive Committee.—Drs. Van Marter, Fields, and Williams.

After the election of officers, the session was passed in informal discussions of the practical topics of our profession, and though no report can be offered, the general tone was advocacy of the advanced methods of operating, discussion about the character of cases presented here in Europe, etc. We hope by next year to offer valuable results of observations made in this Old World.

Six thousand feet above the sea, with a magnificent panorama of lake and mountain scenery, and in view of the spot where Swiss liberty was born, the first "American Dental Society of Europe" was born. May she ever maintain her *elevated* position. May she hold her members as high, and may her lofty example raise the standard on every mountain-top in this country.

We ask for the sympathy and recognition of our much-loved American dental associations. As three or four of the officers have been intimate in the old "Mississippi Valley," the "Mad River Valley," and the "Ohio State" societies, we ask for their sympathetic support. The time of the next meeting, and the topics, will be reported in due time.

C. M. Wright, D.D.S., *Recording Secretary.*

Basel, Switzerland, July 5th, 1873.

PERISCOPE.

Dental Physiology.— * * * It is very important to secure for the expectant mother uninterrupted good health during the whole period of gestation and lactation; therefore ailments or diseases must be promptly met by all the hygienic and therapeutical means at our command.

Whenever sickness is serious enough to affect ingestion and digestion even for the space of one month, it will inevitably leave its marks upon the microscopical structure of the teeth. The proximate cause is innutrition. When this takes place early in gestation, say before the fifth month, the dental germs, which are in a soft and pulpy state, are arrested in growth, and receive an impression which often dwarfs them in size. Not only does this happen to the milk-teeth, but the bulbs of the permanent ones are affected also. But the latter undoubtedly are more seriously affected after birth up to the fifth year by the causes mentioned.

It has often been observed that some children are "small of their age" up to five or six years or older, and that they afterwards "take a start" and grow to the full size of womanhood or manhood which their parentage warrants. Now as teeth cannot enlarge in diameter after the calcification of the enamel and the coronal ends of the dentine tubes, they necessarily remain of the diminutive size which they are forced to take by starvation. And thus it is that we so often observe in the mouths of adults teeth which properly correspond in size to those of the milk-teeth. Especially is this to be observed in lateral incisors, canines and bicuspids. I would suggest that the contour lines or shadings so often seen in the dentine of these teeth are the result of arrested development, showing the size and shape of the bulbs at the time. Sometimes there are several of these in one tooth, corresponding to successive arrests of growth.

The lacunæ or interglobular spaces in dentine are very likely the result of arrested development in the dentinal corpuscles, from a lack of nutrition also.

That these effects may be afterward remedied by good health and a better nutritive supply, I do not doubt. But the importance of the mother's health for the perfect development and growth of the dental tissues is hereby shown.

Dental calcification is a long process, and continues from the fourth month of intra-uterine existence far beyond adult life. It is seen not only in the increasing hardness of the teeth as age progresses, but also in the actual transformation of the dental pulp into a substance resembling bone—a *calcification*, in fact, of its connective tissue.

At the period when the new being is ushered into a new world no teeth are yet erupted, for none are fully formed, and therefore nature kindly furnishes the child with a pabulum for its nourishment, requiring neither mastication nor an effort of the will to fit it for its digestion.

Notwithstanding the changed relations of mother and child as regards position and mode of nourishment, yet the fact still remains as plain as before that her blood should be a magazine plentifully supplied with lime-salts for the continued development and perfection of the dental organs. From birth until weaning is the period in which the *drain on the mother's blood* is most severe, and as lactation goes on, the teeth become rapidly diseased in many cases, and caries of the dentine is more or less developed according to the present and previous hygienic habits and health of the mother. The activity of dental decay in these unfavorable cases is in strong contrast with that of unmarried women and men. Fractures of the bones also heal with difficulty, owing to the diminished quantity of lime phosphate in the blood. Not only do the osseous and dental tissues of the mother suffer, but the whole system is under a general *malaise* consequent on the lack of these salts in *every* tissue of the body. The brain, which uses up so much phosphoric acid in the operations of the mind, is dull and feeble, and the muscles pale and flabby, and incapable of their normal work.

At this period it is customary to apply to the dentist for professional aid, only however to solicit his *surgical* and *mechanical* skill; *rarely* to ask advice relating to hygiene. Who is to blame? Without doubt the dental profession, which has not yet come up to the standard of physiological science which the age demands.

When we have all learned the necessities of a mother famishing for the lack of the necessary elements of nutrition, mothers themselves will become aware of their needs through our instructions at the dental chair, the social circle and the public press, and will apply to those for aid whose duty it is to render it.

A mother in this condition should not be sent away with patched-up teeth merely, but with that knowledge which shall gradually build up again her disintegrated tissues as rapidly as physiological laws will admit. This is not impracticable; it has often been done.

I have sufficiently spoken of *natural* food. I repudiate all inorganic chemical food from the laboratory of the chemist; it is a fallacy to suppose that *artificial* lime salts will produce the desired results. Only so far as they may act medicinally to improve digestion and assimilation will they be of benefit. Nature will reject them as *factors* of nutrition, as the urine and feces will show.

The particle of phosphate of lime which is intended to become a portion of bone or tooth must first have received a certain degree of vitality or life by the wonderful force of the vegetable cell before it can become a living portion of the animal cell. No! follow nature! give the food which she so bountifully provides for her children, and she will respond to your endeavors by granting your earnest desires.—*Dr. Henry S. Chase, in Missouri Dental Journal.*

Gelseminum in Odontalgia.—Gelseminum sempervirens is a plant growing in the Southern States of North America. Its active properties were discovered by accident. It has been for many years past used in America, chiefly by irregular practitioners. A few months ago I happened to hear of its being employed with very great success in a case of pains in the jaw from decayed teeth, and I determined to make some inquiry into its therapeutical virtues. Mr. Jeffs, the apothecary of St. Bartholomew's Hospital, very kindly prepared for me a tincture by macerating for a week an ounce of the root with eight ounces of proof spirit. All the following observations were made with this preparation.

The cases in which I have found this drug of most use are those of bad toothache, which the patients themselves, and even some practitioners, call neuralgia. Short notes of some of these cases follow.

Mary L——, seventeen years old, came March 10th, 1873, complaining of shooting pains in the right side of the face, which had lasted for nine weeks. There were many decayed teeth. She had taken citrate of iron with benefit, but the pains returned when the medicine was left off. Ordered to take ten minims of the tincture of gelseminum in water every three hours. Came on March 13th, saying that the pains had ceased completely the day following the first administration of the drug. To take now instead the quassia-and-iron mixture of the hospital.

Emma B——, aged twenty, came on January 6th, 1873, complaining of pain in the lower and upper jaws, lasting three weeks, and in the head. Last night had no sleep The pains last two or three hours and then cease. Many decayed teeth in both jaws. To take fifteen minims of the tincture of gelseminum, in water, every three hours.—January 9th: Pains much relieved; eating brings them on again, as "it strikes cold." To continue the gelseminum.

Richard T——, aged fifty-three, came on March 22d, 1873, complaining of shooting pains in the upper jaw since Christmas, coming on about four o'clock every day and lasting till midnight; many decayed teeth. To take twenty minims of tincture of gelseminum, in water, every three hours.—March 26th: Pains ceased on the afternoon of the 23d of March, the day after the first visit. To take the quassia-and-iron mixture three times daily.

Fanny S——, aged thirty-eight, came on March 24th, 1873, complaining of pains in the face lasting for fourteen days; throbbing, paroxysmal; gums swollen; many decayed teeth. To take twenty minims of tincture of gelseminum, in water, every three hours. She came again on March 27th, saying the pains were bad all the night of the 24th, but ceased on the 25th, and had not returned. She now only feels weak. To take the quassia-and-iron mixture.—*J. W. Legg, M.D., in Lancet.*

THE ACTION OF COHESIVE FOIL UNDER THE INSTRUMENT.—We beg the patience of our brethren in the endeavor to set forth a few principles relating to the action of cohesive gold foil under the plugger, together with a few strictures. It is designed as a reply to Dr. M. S. Dean's article in the DENTAL COSMOS for March, 1873, headed "Large Crown Cavities with Walls Unbroken."

A free, bold exchange of opinion is often fruitful of good. It is a search for truth, and not either egotism or want of respect for the doctor's ability, which prompts us to pursue this subject. A clear view of a few mechanical principles is chiefly what is necessary, out of the light of which many an "imperceptible space" has been made. We were asked when cohesive foil under pressure ceased to draw upon itself. That question is a very important one; our answer is, under two conditions: 1st, when, from the form of pellets, it has been reduced to absolute solidity; 2d, *when it has received its greatest pressure prior to absolute solidity;* and the latter is the condition we have most to do with. *Let each pellet be introduced with the greatest force which is ever to come upon it,* let it be accurately adapted to the walls, and it will remain so. On the contrary, introduce several pellets with moderate pressure, and then condense with a greater force, or introduce with a large point, and condense with a small one, which is nearly the same thing; of course there will be a drawing from the walls for the very same reason that a pellet draws in laterally under the first stroke of the point.

Is gold foil elastic? After it has assumed somewhat the density of a plug, it is sufficiently so to affect our operations either for good or evil. If it be used to create pressure against tooth walls, to a certain extent it is good, but if used in such a manner as to rebound from them, it is evil. It was long successfully used by being set up with the wedge between parallel walls in the center of non-cohesive fillings, being made to press the gold outward against the walls, which so far as the filling of cavities goes, is the wedge proper. But if this elastic pressure be made use of on the margin of a cohesive filling where a V-shaped space has been left, in which is to be condensed "light unannealed foil," which is to be "held in by overlapping cohesive gold," what is to become of the soft foil when the overlapping cohesive (gold) "is removed rather by the process of finishing or attrition" (the cohesive being imperfect on one side), and the *pressure* is to bear, which is far from "lateral" on neither, but at right angles to a line of its sides? V-shaped wedges never remain where they are driven, unless there is something more than usual to hold them there. A wedge which is designed not to fly out as a result of somewhat contending pressure, would have to be very much sharper than a V: in fact a V-shaped substance could hardly be called a wedge.

We think there are better methods, particularly when the work approaches completion, of filling up this elastic pressure against tooth walls; then it is made to act from a floor of perfect cohesion, if the floor is concave (*slightly*), the pressure may be small; if level, it may be greater—that is, so far as a condition prior to absolute solidity is concerned. In this condition there may be nice adaptation to the walls, and also ample solidity of the gold *without great* pressure, whereas when a wedge is used next to walls, if there is solidity, there must be great pressure, which might not be very desirable. When there is either a level or slightly concave surface, one has almost absolute power over lateral pressure with the privilege of solidity. If the gold is both plastic and cohesive, the most accurate adaptations may be made to the walls. I suppose a cavity nearly full; place, one end of a section of wall one-fourth of an inch long on the center of the work; take the smallest point you intend using, and condense every part of it, which is over the filling, commencing at the center and ending at the periphery; there will then be a part of the pellet standing up by the wall; turn the end of this down on the work and condense as before; then drive the remainder down and directly by and touching the wall. If more elastic pressure is wanted, do the malleting on this slightly elevated peripheral ring with a smaller point. If you increase the length of this ring, it will not matter practically, unless you carry it on quite out of reason. Its increase in length is almost entirely produced by a slight swell outward, and even with the point where the blow is struck. Where gold foil is manipulated in this manner, we have never seen even a stain to show that there was not accurate adaptation. If one is compelled to use gold which is annealed to hardness, against thin walls, we know no method not attended with great uncertainty. To this condition of harshness is due many failures; it cannot be accurately adapted to the walls without more force than it is always judicious to apply, unless the pellets are so small as to make the operation too tedious. We think if the gold-beaters would give us some unvarying rule by which we can re-establish the cohesiveness of thin gold when it has been lost, without destroying its plasticity, that they would greatly benefit us. The methods among dentists generally are somewhat slow, and attended with some uncertainty. We could suggest some arrangement with a thermometer.

Improper annealing and untimely condensation has been our stumbling stone, and observation compels us to think it has been the same thing with many others, even including Dr. Dean, who thinks that "margins" can be made perfect only by the principle of wedging.—*Dr. E. S. Hunter, in the Am. Jour. of Dental Science.*

TREATMENT OF IRREGULARITIES OF POSITION IN THE PERMANENT TEETH.—Mr. Mason then read a paper "On the Treatment of Irregularities of Position in the Permanent Teeth," of which the following is an abstract:

I do not attempt here to make any observations on the cause of dental irregularities, on which exhaustive papers have been read before the Society by Messrs. Cartwright and Coleman, but simply to give what I have found the readiest way of reducing such irregularities as we most commonly meet with.

I propose to divide our subject to-night into two heads: first, the treatment of cases not requiring mechanical appliances; second, cases that need such aid.

The first-named cases are frequently the result of the crowding of the teeth by pressure forwards of the back teeth; and here I would note, not only a remedy for the mischief, but its frequent cause—that is, want of space for the permanent teeth, owing to the removal of the temporary ones before they would naturally fall out; and hence I take every means practicable to retain the temporary molars as long as possible, for the removal of a second temporary molar at an early period will often cause the first permanent molar to encroach on the space to be hereafter occupied by the bicuspids of the second set to the extent of the whole width of the extracted tooth, and always to a very considerable degree; I therefore urge that such teeth be filled if at any time caries set up in them.

With regard to the treatment of irregularities caused by insufficiency of room: to get the offending teeth into the dental arch, it is clear that we can only make room for them by the withdrawal of others. To begin with the central incisors in either jaw: crowding will often make them diverge either outwards or inwards, or cause them to grow in such a manner as to present the sides of the tooth to the front, instead of its lateral surface. The obvious treatment is, the removal of the milk lateral incisor; and I find that if we give room in that way, we obtain our end in many cases without having to resort to the aid of correction plates. The lateral incisors are often the subject of similar displacement, and must have similar treatment, the temporary canines being removed to make way for them.

The bicuspids, unless their space has been lost by the early removal of the milk molars, find their way into their normal places without much trouble, for their predecessors leave them abundance of room. Should they, however, be pushed out of place, I should not hesitate to remove the bicuspid, for its room would, under the circumstances, be an advantage.

The canines are very frequently thrust out of the dental arch by want of room; occasionally cases will be found where the lateral and bicuspid are completely touching, leaving no room for the canine at all. My mode of procedure in such a case is to leave the six front teeth intact, and sacrifice a bicuspid, or first molar, on each side. Which of the two is to be the tooth sacrificed must depend on circumstances. If the molars and bicuspids are all quite sound, and the mouth is not very crowded, the removal of the first bicuspid on each side will set the mouth straight in the readiest way, the canines quickly subsiding into the spaces thus created. But if, as is very often the case, the first molars are the seat of disease, then, if the bicuspids are not much developed, or their antagonistic teeth come sufficiently through the gum for their cusps to interlock, the removal of the faulty molar would be preferable to the withdrawal of a sound bicuspid; and if, as above stated, the antagonistic bicuspids have not come together sufficiently to prevent their dropping back, I still think the first molar, even if sound (if a tooth has to be sacrificed for room), is the best to be extracted; for it is much more frequently the seat of disease than the bicuspids. But of course it must be seen that nothing will prevent the bicuspids falling back, or the object will not be obtained.

With regard to the treatment by mechanical aid, I find the cases in which the lower jaw requires such assistance so rare that I cannot give any examples of it, for I have almost invariably found that when there is sufficient room in the lower jaw the teeth will arrange themselves; and although, as in a very recent case in my practice, of which I will presently describe the treatment, a tooth has been forced out of its place by the mal-position of its antagonist.

Regulations by torsion I learnt from Mr. Sheffield, of Exeter, and though the practice has been adopted by him for many years, I know of none but his pupils following it, among whom I would name Mr. Woodhouse. This plan requires, as an element of success, that when the tooth or teeth are turned on their own axis, they shall be quite in their place without further operation. A model being taken, the tooth or teeth must be turned and corrected on it, and then a plate fitted accurately round the inside of the incisors, coming quite to the inner edge of these teeth, capping the temporary molars and permanent first molars. I like to have the bearing hard on the first milk molar; after the plate is in its place it should not have to be removed for some time. A bar must also be carried from first molar to first molar, fitting close to the outside of the central teeth, to keep them steady when turned. When the plate is ready, I seize the tooth or teeth with a pair of forceps, like a pair of broad, flat pliers, the biting surface of the jaws of the instrument being covered with lint or chamois-leather, to prevent injury to the enamel of the teeth. Then with a steady twist revolve the offending tooth or teeth in their sockets, and immediately place on the plate, and the work is done. I have never seen any unpleasant effects from the torsion in this way, the pulp not being injured by the process; for I am continually meeting with patients who have been treated by Mr. Sheffield thus—one quite thirty years since, in which the condition of the turned teeth is in every way satisfactory. After the operation, a cooling lotion is required, to keep down any inflammation; and the plate must be constantly worn during a period of from four to six months, to ensure their not relapsing into their old position.

In cases where one tooth has to be brought forward as well as turned, I fit a plate as already described, only without tampering with the cast in any way, a screw being brought to bear on the teeth that require correction at about the point where the distal, lateral, and lingual surfaces of the tooth form their junction, whilst a rigid bar is carried round from first molar to first molar, to determine the degree of prominence, in order that the teeth may not, by the pressure of the screw, be thrust too far out, but, by the restraining action of the bar, be revolved on their own axes when the desired prominence is gained. The screw should be turned every morning and evening, until as much pressure is produced as the patient can bear; if necessary, the advancing tooth must be followed by building up plate behind it, a fresh screw being inserted as required. By this means, in nine visits, extending over seven days, a complete correction was made of the offending teeth in the case before you. After the teeth are in position, I take a fresh cast, and adjust my plate and bar to retain the teeth in their places; the apparatus is then worn by the patient some four to six months, to ensure the teeth retaining their new positions, the hold of the caps having been slackened to allow the patient to remove the plate for the purpose of cleaning it and his teeth.

In a case requiring the lateral incisors to be brought forwards, and the central incisors back, as absorption of the fangs of the temporary molars was commencing, I had to cap the permanent molars to assist in supporting my plate. The second temporary molar was gone on the left side of the mouth. I used with success two screws on the laterals, and brought back the centrals by means of india-rubber bands carried from the button in the palate over the teeth in question, and by this means soon drew them back. A bar had to be placed, and the plate readjusted when the teeth were in position to retain them there, as in the last case. This bar is necessary when the teeth have been brought back or turned, but not needful when simply pushed forwards. India-rubber bands will be often found useful to draw teeth together which are separated, or backward when too prominent; but, although self-acting, they require frequent watching, or they may loosen the teeth.

In another case the four upper incisors fell completely within the teeth of the lower jaw, leaving far too little room for the canines and bicuspids, and causing the upper lip to be very flattened, giving an undue prominence to the lower jaw. When the mouth was closed, the lower shut so completely over the upper teeth that the latter were entirely covered. I constructed a plate, capping the milk molars and first permanent molars; to enable me to keep the front teeth sufficiently apart for them to clear the lower teeth, a screw was placed against the lingual surface of each tooth, to be pushed forward. The plate was placed in the mouth on April 9th, and by the 30th they were completely over the under ones, so that I was enabled to dispense with any further pressure. The plate in this case should not be left off for a couple of months, to ensure the permanence of the correction.

In another case, the young lady, then twenty years of age, came to me in September, 1867. I found the upper teeth very much projected, with an extremely wide space between the central incisors. The bite was exceedingly awkward on the left side, where, when the mouth was closed, the two bicuspids stood so much out that they overhung the antagonistic teeth, instead of fairly falling on them; and on that side of the mouth the first molars above and below had been removed some time before I knew her.

I fitted a gold plate, capping the first and second molars and second bicuspid on the right side, and the bicuspids and the second molar on the left side, carrying the plate across the palate within the line I intended the front teeth to take. I extracted the first bicuspid on the right side before I put on the plate, and my first endeavors to move the teeth were with stiff india-rubber bands passed over the front teeth, and a button placed in the plate in the center of the palate.

The plate and bands were put on first on the 13th of September, the bands being changed every day, as they lost some of their elasticity after they had been worn about twenty-four hours; but I found them utterly fail in the attainment of my object, for by the 24th of September I could report no progress.

On the following day I carried a stout gold bar round the outside of the teeth, with a screw bearing on the center of the labial surface of each of the four incisors; these were screwed up as much as could be twice a day generally, and as the teeth were moved the bar was shortened to follow up the work. By the 15th of October the space whence the right bicuspid was removed was almost closed up, and the central teeth had only a slight separation. I adjusted a plate and bar, which were worn constantly for many months after, and then by night only, for a period of, I believe, two years. I found that the incisors after they were brought back were very awkwardly long; I therefore removed some of their extra length. When I first saw this case I feared that if brought back the teeth would be apt to relapse into their old places, and suggested the shortest way would be to remove the offenders, and wear the incisors and canines on a plate, but the young lady elected to have their correction attempted, and I think the result was a success.

With regard to the age at which this work should be done, I prefer to correct these cases as early as possible after they show the necessity for mechanical assistance. The last case will show that it can be accomplished much later, although with a great deal of trouble to the operator, and pain to the patient. I prefer the use of the screw to compressed wood, for the latter I found to occasionally slip out of position, besides being much slower in operation; and I have a preference for speedily finishing cases, as it must necessarily be less trying to the patient, whilst the permanence of the work is not affected by it. I also think the screw more desirable for bringing teeth forward than the inclined plane, placed on the lower teeth; for, by the latter plan, the patient has constant worry, especially during meals, and the discomfort, to say the least, at those times, of the teeth under treatment striking on the inclined plane is, I think, much more trying than the pressure of the screw, which only causes pain at the time it is moved.

Actual torsion should be performed as early as practicable, before the root of the tooth has completed its growth.

Plate of either gold or dental alloy is more manageable than vulcanite, as it is easier to follow up advantages gained by building up plate than by taking a fresh cast, and by making almost a new frame when the changes of the mouth require it. If it is asked whether the success justifies the means used in moving the teeth that are abnormally situated, my answer is, that I consider the patient is amply repaid for anything he or she may undergo, for I have seen very few cases where the teeth have relapsed, and I have found such cases were attributable to patients leaving off the plates too soon, and are generally those where the teeth have had to be pushed back; when the reverse has been the case, the lower antagonistic teeth keep them effectually in their places.—*Proceedings Odontological Soc. of Great Britain, in British Jour. of Dental Science.*

Death under Chloroform.—Thomas Breton, aged sixty, the insane criminal who died under chloroform on the 15th inst. at Broadmoor, is another of the numerous instances in which death may follow the use of the anæsthetic, in spite of every precaution. On the 14th inst. he had fallen and injured his perineum, as a result of which blood issued from the urethra, while no urine was passed all the next night. The patient's resistance to the introduction of the catheter necessitated the administration of chloroform, which was accordingly done in a large well-ventilated room with Clover's apparatus, the bag containing at the time 11,000 cubic inches of air, of the proportion of 25 minims of chloroform to each 1000 cubic inches. At first nothing abnormal occurred; the patient became insensible; but on the introduction of the catheter he struggled so that the inhaler was again applied. Seven minutes thereafter the pulse flickered and stopped. Restorative efforts were immediately practised, but in vain. At the autopsy the right side of the heart was flaccid and full of fluid blood, the left side empty and contracted, while the arteries in the brain and throughout the body were atheromatous. Blood was found infiltrated into the cellular tissue of the perineum and scrotum. The verdict at the inquest was of course to the effect that death arose from chloroform, but that the same was carefully and judicially administered. During its administration Drs. Orange, Cassidy, and Buck were present.—*The Lancet.*

Cement.—A cement for attaching rubber to wood or metals is made of finely-pulverized lac dissolved in ten times its weight of concentrated ammonia. The solution takes place in a few days in the cold, and more quickly if warmed.—*Scientific American.*

An Easy Method of Roughening Plugger Points.—It has been suggested that a *broken* surface for a plugger point was in many respects superior to an ordinarily serrated one. This I believe to be true; but to break a point that it may be of an oval or spheroidal shape is no doubt impossible. A surface may, however, be produced which in all respects is equal to a broken one by the following method: First, file up the point to the shape desired, and finish on a fine emery wheel; take now a piece of new emery paper of moderately coarse grade, lay it upon a well tempered anvil, and while the steel point is yet soft, place it upon the paper, and with a smart blow of a hammer drive the point upon the emery; indentations will thus be made. Lift the point to a fresh surface on the paper, and drive again; repeat the operation until the point is uniformly indented. For spherical points the paper may be bent at a right angle and placed in a similar angle of the anvil, when the *sides* of the point will receive the indentations equally as well defined as the extreme end. Harden without drawing the temper, and examine under a glass.—*Dr. W. S. Elliott, in Missouri Dental Journal.*

Remarks on Gout.—The last report of St. Thomas Hospital, London, contains an article on gout, by Dr. Ord. It closes with the following summary of his views:

"1. Gout is a mode of decay of the whole system, marked by the deposit of urate of soda in and about joints, and by local inflammation of a particular kind. 2. The deposit of the urate is a result of local or general disintegration, and is not to be regarded as a means of eliminating urate from the blood. 3. The local inflammations do not necessarily depend upon the deposit of urate, and the deposit is not a consequence of inflammation; at the same time, it is probable that excess of urate in the blood produces irritation of tissues. 4. The local inflammation is peculiar in respect of the ease with which it is produced, of the pain by which it is attended, and of the products, which are chemical rather than structural; chemical substances of low molecule, tending to crystallize or to be dissolved, being formed in the part, instead of substances of high molecule tending to be organized. Interstitial subcrystalline deposit is common, suppuration rare, in gout. 5. The local inflammations are set going by local exciting causes. 6. The local degenerations and inflammations tend to infect the rest of the system through the blood, and to set up similar actions elsewhere through reflex nervous action."

As regards treatment, Dr. Ord says that, while the old rules of regimen still hold good, "in the way of remedies, eliminant medicines, among which pure water should hold a high rank, are regarded as of high value, and to their use must be added the adoption of all possible measures to promote the concoction of healthy tissue, such as the use of cod-liver oil, of milk and fatty foods, and of good meats in moderate quantity, and the administration of tonics of various kinds, such as iron, arsenic, and the vegetable bitters;" while the local application of iodide of potassium will also be found useful.—*Medical and Surgical Reporter.*

HINTS AND QUERIES.

What is the most approved method of administering ether for anæsthesia? What are the most reliable symptoms of anæsthesia from ether?—O. L. D.

I have used nitrous oxide as an anæsthetic for a number of years, but in a large majority of cases have failed to produce entire insensibility to pain. I have administered the gas with a double-valved inhaler directly from the holder.

Has unmixed gas proved generally reliable as a complete anæsthetic in other hands, or do those most successful with it mix with it other agents?—O. L. D.

Porcelain Base.—Some time ago I noticed an inquiry in regard to "Porcelain Base," asking who was the patentee, and why it had not been more generally introduced. I think it a duty I owe to the profession, knowing something about it myself, to take the liberty of answering.

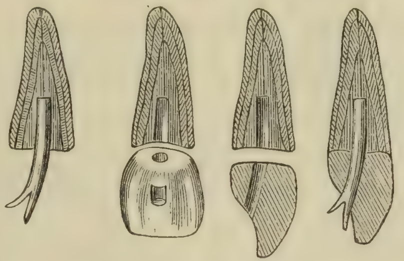
The "Loomis patent" was improved on by Dr. Wm. E. Dunn, of Ohio, in 1865, or about that time.

Dunn's patent consists in moulding the teeth and biscuiting them, and then setting them in the body or base of the plate, which process is as simple as mounting teeth on rubber, and in use is far superior to all other kinds of work.

Why it has not come into more general use I cannot answer, unless the patentee (Dunn) don't take the trouble to push it. I have the best success with it of anything I ever used, and my patients will have nothing else; and those who have had trouble in wearing other styles of work, and especially rubber, speak of it in the highest terms of commendation. It is the balm for every sore mouth that I have found, giving entire satisfaction in every case.

I can assuredly recommend it to dentists as being the thing that has been so long looked for, and for cleanliness, comfort, durability, and healthfulness, is unequaled by any other style of work now made.—H. R. R.

Pivoting Teeth.—A word on pivoting teeth. Each has his opinion: some favor the operation; others look upon all forms of pivoting as failures; but by continuing to exchange our ideas we may hope to bring the operation nearer to perfection. The plan of M. H. Webb, D.D.S., seems to be a very good method, only a little too complicated, and consequently expensive. My idea is that the operation should be made as simple as possible, and so give our patients a lasting benefit at a moderate cost. To make any operation of the kind successful, we should have a good root to build upon; file a groove in it, and then grind the crown to fit it perfectly; drill the cavity in the root for the gold wire; have the wire serrated so that it will not slip after it is anchored,—the portion projecting from the root split. The crown should have the hole drilled clear through. Slip the crown over the wire; pack in gold to act as a wedge; file off the surplus wire, and polish if there is any space between the root and crown, and fill in with gold. To my mind this is perfectly simple, reliable, and permanent. This plan does away with all unnecessary appliances, but the only way left to get the crown off the root is to take out root and all.—G. P. Carman, D.D.S., 199 *South Clark Street, Chicago, Ill.*



Legislation Relating to the Profession.—I have been informed that in Canada and England the law prohibits by severe penalty the use by any one of the title "doctor" who has not had it conferred by some legally authorized institution; while at the same time it does not necessarily, on that account, prohibit his practicing medicine or any of its specialties. While some of the proposed laws to regulate medicine and its specialty of dentistry in this country have failed on account of opposition, which perhaps was not all unreasonable, it seems that a provision like the one referred to could not reasonably be objected to.

If John Jones chooses to seek patronage as a dentist without having pursued such a course of instruction as would secure him, from proper authority, the title "doctor," let him put on his sign, or card, simply "John Jones, dentist," or Mr. John Jones, dentist," if he prefer. If the public choose to patronize Mr. Jones, let them do so, but if they prefer a dental doctor to treat their mouths, let the law provide that when the title "doctor" appears upon the sign it shall be there by authority. This would not only protect the public against deception, but would secure to Jones's neighbor, who had regularly received the title of doctor, the distinction which is his just due. It would also rescue the title from the contempt often brought upon it by ignorant persons who assume and use it for purposes of gain. The subject seems to me of practical importance and worthy of attention.—D. L. OVERHOLSER, M.D.

A CASE IN PRACTICE.—About two weeks ago I had a case where the nerve (in a right upper first bicuspid) was partly dead, and to destroy the remaining *live* part I applied (as usual) the nerve paste, and sealed it up with Hill's stopping. About three days after I again saw the tooth. Some of the arsenic had leaked out (in some way) which has made the gum between the bicuspid and eye-teeth quite sore. I am afraid it has penetrated beyond the foramen. The alveolus is very sore to touch, at times. Will some one please inform me what to do in such a case, and oblige.—DENTAL STUDENT.

INSTANCE OF ABSORPTION OF THE ROOTS OF PERMANENT TEETH.—Twenty-six years ago I sustained, by a fall, injury to the left superior central and lateral incisors, which had the effect of loosening the teeth and producing subsequent inflammation and soreness. After a short period the soreness passed away, but the teeth became darkened, and thus remained, with occasional discomfort, for eighteen years, when the crown of the lateral was removed with the fingers. It presented the appearance of a cast-off deciduous—the root apparently having been absorbed.

During the winter of '64–65, while attending lectures at Philadelphia, the central incisor became troublesome, and received the treatment of Professor McQuillen. He diagnosed absorption of the apex, but opened the crown, and finally filled with gummed cotton covered with gold. This tooth remained comfortable until it was removed, a few days since, on account of a suspicion that it was the cause of a neuralgic affection of the neck and shoulders, which, however, did not prove to be the case. The root had the appearance of having been broken diagonally about its middle, as the line of fracture was sharp and well defined. The sulcus is now closed, and no remnant of the apex has been discovered.—W. S. ELLIOTT, D.D.S., *Goshen, N. Y.*

AN EXPERIENCE WITH CELLULOID.—On July 19th I had an experience with celluloid somewhat similar to "Experiment" in "Hints and Queries," July number DENTAL COSMOS. I was not vulcanizing, however, but using the celluloid apparatus. In putting down the clamp, some of the plate pressed outside of the flask and burned almost to nothing. The plate inside the flask was not injured. The flask was covered at the time with sweet oil, and the thermometer indicated 300° only. Who can explain? Is there any danger of the entire plate being destroyed, or of "explosions?"—B.

HONOR TO A DENTIST.—Notwithstanding the absorbing attention necessary to success in dentistry, and the confining character of our work, it is interesting to note the large and honorable share which some of our leading *confrères* enjoy in public matters. Instances will recur to our readers.

From Montreal, the metropolis of the Dominion of Canada, we learn that Dr. A. Bernard, the oldest living practitioner in Canada, and President of the Board of Examiners of the Dental Association of the Province of Quebec, has recently been *unanimously* elected to the mayoralty of that growing city, after occupying the important position of chairman of the finance committee, and serving the city as councillor and alderman for over eleven years.—B.

THE

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ORIGINAL COMMUNICATIONS.

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 461.)

THE REGION OF EXPRESSION—*Continued.*

The Lymphatics.—The lymphatics of the region of expression lie for the most part along the junction of the cheek with the nose. They are received at this point from the central portions of the forehead, and pass downward over the face, thence into the submaxillary lymphatic glands. It is exceptional to find glands upon the face. A small one is rarely seen at the side of the root of the nose, and another about the size of a pea we have recognized, when enlarged, in a case of syphilis involving the jaws. Velpeau speaks decidedly of the median parts of the forehead and eyebrow being drained by a set of vessels distinct from those supplying the outer part in common with the temple and side of the face. If this be the case, we may expect diseases of the outer portion of the forehead to involve the lymphatic glands at the angle of the jaw, and those of the median portion the glands about the chin.

The Porta.—We have observed that the facial artery, vein, and some of the lymphatics cross the lower jaw between the anterior margin of the masseter muscle and the lateral margin of the depressor anguli oris. Here the parts are superficial, and being covered with the thin platysmus myoid muscle, fascia, and skin, can be readily compressed in the living subject. An appropriate name for this space is the *porta,* since it is truly the gateway to the region of expression from the neck. If in burrowing of pus about the supra-hyoid space the face is involved, it is by means of pus entering the region of expression through the porta.

There is a point worthy of consideration in this connection, namely, the almost exact limitation of the branches of the artery and vein to the median side of their respective trunks. The only exceptions we recall to this are two in number, the masseteric branch of the artery and the palpebral branch of the vein, both of which are small. In the absence of other vascular structures to the outer side of the vessels, it at once suggests itself to the mind that an incision could be made here with less damage to important parts than any other in the region. If in the subject the integument over the porta is made tense by being drawn inward, an incision is made through the skin over the anterior edge of the masseter muscle, and extended thence upward and inward to the distance of one and a half inches,—the platysmus myoid is brought to view at the lower part, and the fat of the cheek fairly entered at the upper. The former structure being now divided, the jaw is at once exposed; the artery and vein are drawn well to the inner side and are not seen. With the aid of a little dissection, the handle of the scalpel can push the edge of the masseter a little backward, and the vessels well forward, so that the porta can be easily displayed. If the subject be emaciated the skin can be readily stretched backward completely over the angle; the masseter can be lifted a little at the middle of the anterior edge, and the scalpel with ease explore the parts beneath it as far as the base of the coronoid process and the glistening fibers of insertion of the tendon of the temporal as they pass down along the edge of this process. In the same manner the cheek can be pushed upward and inward, and display the deep fat in the hollow. The finger can now be readily passed upward behind the zygoma into the temporal fossa. An incision such as this, without wounding a single vessel, and dividing no part of importance (save the filaments of the facial nerve crossing the porta), affords an easy access to many remote points of the side of the face. Were such an incision made on the living subject, the only probable complication occurring would be the rigidity of the masseter muscle.

Facial Œdema.—The effusion of serum into the tissues of the region of expression will be naturally determined by the distribution of the fat and connective tissue. Thus we find the lower eyelid a favorite locality for such collections when the fat is absent and the connective tissue is loose. In determining the degree of impairment in the return of the venous blood, the physician finds the amount of œdema present in the lower eyelid of great value.

Every dentist will at once recognize that the examples of swollen faces coming under his notice are purely local in their origin, and are almost always due to irritation within, in the mucous lining of the mouth. We will instance the usual swelling accompanying the formation of an alveolar abscess. Here the transmission of diseased action is mediately from the tooth to the alveolus, and thence to the gum. Under aggravating causes this soon involves the mucous tissues. Having arrived at such a point, we can readily explain the subsequent enlargement of the side of the face, on the general principle which has been firmly established, viz., that inflammation of mucous surfaces tends to submucous œdema. This is subject to no exception where a serous or tracheal covering is absent from the mucous tract.*

We expect, therefore, that the buccal and labial tissues will be first affected. The lips will be everted and thickened, and the eye will be closed —more, however, by the pushing upward of the lower eyelid by the engorged buccal tissues than by proper infiltration.

Another example of submucous œdema is seen in the conjunctiva. A very slight irritation will cause protrusion of this membrane; and when excessive, is seen to escape from the palpebral chamber and lie as a red and thickened fold between the lids. This condition is recognized as *chemosis*. Persistent chemosis leads to general infiltration of the structures of the lids when the subcutaneous tissues become involved. This, however, is not common except in severe general ophthalmia. The fact that a subcutaneous œdema may arise is an interesting fact, though it be dependent upon one which primarily is of submucous origin. In erysipelas of the face the swelling is from the first subcutaneous. Here we have a diffused redness commonly of a brilliant color, which may extend from the scalp downward, or, though less frequently, from the face upward. The greatest swelling occurs where the connective tissue is the least compact, as at the lower eyelid and the comparatively well-defined subcutaneous layer about the ear.

In the swelling which arises from blows on the face we expect some of it to be due to the effused blood from lacerated capillaries. It tends, however, to become submucous. An easy way of estimating the amount of swelling present in the cheek tissues is to pass the index finger of the right hand within the mouth, and the other on the skin without.†

The position of local œdema of the forehead is determined as follows: The resistance on both sides of the thin and compact layer of tissue,—the skin without, and the pericranium within,—is so great that the swelling assumes a flattened form, and gravity will aid it in taking a position below the cause engendering it. Thus a person stung on the forehead by a bee will have the greater amount of swelling take place *below* the injured point. In a case of necrosis of the frontal bone, where the offending fragment was situated near the frontal eminence, we found the associated œdema near the median line at the brows. These collections are very deceptive. Their resisting boundaries give to the fluid the physical signs of an abscess, and if there be associated redness of the skin the incautious may needlessly open them.

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* In the latter case, as shown in the intestines, the presence of a serous covering materially modifies the process, and, indeed, forces the fluid, through increased activity of the follicular glands, directly into the alimentary canal; or in the trachea and bronchia (when the resistance of the bronchial and tracheal walls correspond to the serous membrane already mentioned), into the respiratory tract. But in the mouth, nose, pharynx, and the parts about the glottis, there is no such limitation, and an œdema is developed at once in the submucous tissues.

† In the swelling of decomposition the lips become greatly everted, and the lower eyelid puffed up. These are from both the above causes combined.

Inflammation.—Inflammation in the face is, as a rule, circumscribed. This can readily be accounted for by the close connection existing between the skin and the subjacent parts. When it becomes diffuse, as in erysipelas and phlebitis, we are exceedingly liable to encounter systemic causes operating through and beyond the merely local manifestation. Abscesses of the face are, as a rule, small. They are commonly the result of acniform inflammation. Persons the subjects of chronic acne will occasionally present small abscesses, which may be mistaken for sebaceous tumors. The happiest results are obtained in their treatment by making a minute opening into the collection, and maintaining the patulency of the orifice, while a thick layer of collodion is applied to the skin.

Gangrene.—Notwithstanding the richness of its vascular supply, the face is at times the seat of mortification. This, however, is not the result of a purely local cause, except in the intense engorgement of the parts seen in cancrum oris, but is the result of arterial obstruction. Mr. W. Savory* has narrated an example of this disease occurring in a male subject but thirty-six years of age. The disease began in the lower eyelid. Thence it passed to the eyeball, and afterward downward, exposing the malar, maxillary, and nasal bones, which crumbled away in successive small sequestra. The disease eventually attacked the base of the skull, and caused death by intra-cranial inflammation.

At times, pressure from an adventitious mass will cause sloughing, as occurred in a case mentioned by Mr. John Birkett:† a naso-pharyngeal tumor invading the face from behind induced sloughing of the cheek.

Carcinoma.—Cancerous disease of the face presents itself in three forms: epithelioma, the rodent ulcer, and encephaloid. Studying these diseases from an anatomical point of view, we find that epithelioma is found most frequently at the junction of skin and mucous surfaces, such as the edges of the eyelids, the nostrils, and the lips. Why it is so common on the lower lip and almost unknown on the upper, why rodent ulcer is more frequent at the outer canthus of the eye than the inner, we cannot explain. It is worth mentioning, however, that the lower lip and the outer canthus are more moveable than their opposites, and, therefore, less able to resist the localization of morbid action. Encephaloid disease of the region of expression is always secondary to its more deeply-seated origin. In obedience to the principles announced under the head of œdema, it is apt to spread along the mucous tissues before involving the skin, and occupies the loose subcutaneous structures of the lower lip to a remarkable extent.

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* Med. Chir. Trans., xxxix.

† Brit. Med. Journ. i., 1858, p. 119.

Lardaceous cancer may also involve the face as a complication of malignant polypus. Mr. Collis* has given us an example of this rare disease. A baker, aged eighteen, after an attack of measles, complained of difficulty of breathing through the right nostril. A polypus quickly made its appearance in this situation. "The skin of the nose, forehead, and face, became rapidly infiltrated with cancer-cells, giving the skin an appearance as if seen through a pocket lens. This condition extended over all the face and neck, the glands became distorted beyond belief, his breathing became affected, and finally he died exhausted by pain, dyspnœa, and difficulty in swallowing, in a year and a half after the first symptom of polypus."

Chancres of the face are exceedingly rare. Bumstead† asserts that the soft sore is here unknown. Indurated chancres of the lips are occasionally seen, and present appearances so closely resembling cancerous infiltration as to have deceived experienced observers.

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

SOUTHERN DENTAL ASSOCIATION.

FIRST DAY—*Morning Session.*

THE Southern Dental Association held its fifth annual session in Raine's Hall, Baltimore, commencing July 29th, 1873, the President, H. M. Grant, in the chair.

The session was opened with prayer by the Rev. Dr. Spangler.

The roll being called, and the members present having taken their seats, the President delivered the annual address, which was listened to with marked attention.

The speaker dwelt upon the favorable auspices under which the Southern Dental Association held its present meeting. Five years had elapsed since its organization, and one need only read its transactions to be impressed with the spirit of vitality which it exhibited. Its reports and discussions were of the highest order, and evinced a degree of scientific progress that was indeed wonderful. On the list of committees might be seen those on histology, etiology, etc., showing that the mind of the profession was advancing out of the contracted sphere of mere artistic mechanics into the broader and higher fields of thorough scientific investigation.

He referred also to the rapid strides which the dental profession at large had made during the past few years. There were now published seven well-sustained dental periodicals. Eight dental colleges were in prosperous existence, upon which hundreds of students annually attended. These facts, he claimed, spoke for themselves, while the establishment of a chair of Oral Surgery in the University of Pennsylvania, and the introduction of dentistry into Harvard, might be taken as the signs of the times.

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* Cancers and Tumors analogous to it. By M. H. Collis, p. 112.

† On Venereal Disease.

He further claimed that dentistry was but a specialty of medicine, and should never be considered in any other light. It should be classed along with aural and ophthalmic surgery, neither of which was ever considered apart from general medicine. He thought that oral surgery was destined to be a necessary chair in all medical schools.

Afternoon Session.

J. H. Harris, S. H. Guilford, and A. F. Herr were received as delegates from other bodies.

The report of the Committee on Publication was read and received.

The report of the Committee on Physiology and Surgery was called for, and Dr. Gorgas read a paper presented by Dr. S. P. Cutler, upon "Physiology." The paper went into the discussion of physiological action in animals and plants, defining the relations physiologically established between the vegetable and the animal world. It also discussed the molecular motion necessary to produce life, showed the process by which life was sustained, and explained the phenomenon of death.

Dr. Chupein moved that the thanks of the association be tendered Dr. Cutler for the very able paper which he presented.

Dr. Clark. I would have preferred not saying anything upon this paper, but this resolution has forced me to say that it contains many statements which this association cannot indorse. I am a friend of Dr. Cutler, but, as a member of this association, I must put my veto to that resolution. It would force upon us the indorsement of mistakes that would reflect great discredit upon us.

Dr. Chupein. The doctor says the paper is open to criticism, but does not show where. I am free to admit, however, that it does not cover the ground as a report from that committee.

Dr. Johnson. Is not the committee on dental physiology? If so, then the paper certainly does not cover the ground.

Dr. Gorgas stated that he had studied the paper more closely than he would otherwise have done, having to read it before the association, and he was prepared to pronounce it the most comprehensive one he had ever seen from Dr. Cutler.

Dr. Chupein. I could see nothing in the paper but what accords with the accepted views of physiology.

Dr. Clark agreed that the paper was an able one, but declared that he was not willing to indorse it by such a resolution.

The motion was then put to the house, and lost.

Dr. Walker reported the following resolutions in reference to the refusal of the railroad companies to grant a reduction of fare to delegates to the association :

Resolved, I. That the recent action of the railroad combination, in so far as it applies to dental, medical, or scientific associations, is not only uncalled for, but highly reprehensible.

Resolved, II. That gentlemen who attend as delegates upon such associations do so at great personal sacrifice for the benefit of humanity and the general public good, and that their influence tends greatly to advance the interests as well as the area of civilization, and by so doing to confer a positive benefit upon railroads, which depend upon the advancement and extension of civilization for their business and welfare.

Resolved, III. That, therefore, railroads could well afford to pass such delegates to and from their places of meeting, and that their refusal to grant at least free return papers is placing a severe tax upon men who spend much time and labor for the public good which they are ill able to bear, and that such action by the railroads is as shortsighted as it is arrogant and selfish. J. R. WALKER, *Committee.*

The resolutions were adopted.

The report of the Committee on Histology and Microscopy was called for.

In the absence of a report, Dr. Clark was called for, and he responded as follows: My views upon dental caries were from the beginning different from what I read in the books, but I was willing to give way. But now I assert, positively and from my own investigations, that I was right. In all our works we have been taught that caries is the result of chemical action upon the enamel, but they do not tell us what the agents are that produce this action. Some say they are acids. I assert positively that it is not accomplished by acids.

Now the great trouble in settling this question has been to get a microscope of sufficient power to make these investigations. Our opticians are behind in this matter. A microscope of from 1700 to 1800 diameters is necessary for developing what I wish. Let me illustrate my position. On one occasion I had a building in Savannah, and around this fifteen or twenty guano carts passed daily. There was an old man there who told me that he never went around that way without coughing and having to rub his eyes. I found after several days that it was due to the guano carts, which passed about that time. In order to establish my views concerning this matter, I took a glass and moved it through the air just after the carts had passed. I then covered this over with another glass and subjected it to microscopical examination. After the fifth or sixth trial, I found innumerable little parasites, with little black heads. I then commenced investigating the cause of dental caries. My great difficulty I found in making suitable preparations. I had been using the microscope of the college at Savannah, but this was not strong enough for my purposes. I then wrote to New York and got one of greater power. With this I could see nothing, as my preparations were all too large for the microscope. After several attempts, I succeeded. With a power of 1800 diameters, parasites can be seen. They appear in the pits, fissures, and roughened surfaces of the tooth, where they form a laboratory. Cutting through the enamel, they make short work with the dentine, which is their natural food. I brought these views forward at Charleston, and I asserted positively that I was correct. Now for the practical bearing of this, for this is the end in view. I went to work to find out what agents would be destructive to these parasites. I found that if I placed the hundredth part of a drop of carbolic acid on them they would stretch out. Now, if you take a tooth with the pulp exposed, you will be forced in treating it either to destroy the pulp or cap it artificially, and then fill over it. Now, if you apply carbolic acid there, and in about a week remove the application, leaving the carious portion, and at the end of two days fill on the carious portion, which has been devitalized by the carbolic acid, you have a natural cap. To illustrate further: If we take a sound tooth and fill after removing the carious portion, we will find that it becomes blue all around. This is not the case where the tooth has been treated with carbolic acid. Again, take tobacco-chewers who have been chewing for some ten years. Now, some of you may have advised the use of tobacco as a preservative of the teeth. I have myself done so. Tobacco causes devitalization of the caries, as it is a disinfectant. We frequently have calcified dentine as the result of the use of tobacco. And, again, the old mercury fillings furnish us with another illustration. These fillings, which, fifteen or twenty years ago, were put in by the backwoods dentists, who made up a dish of it in the morning, to be used that day, and then put it in with their fingers,—these very fillings, when taken out, show the tooth as black as jet, but very hard. I never understood the cause of this before my investigations, but now I know that the cause lies in the destruction of the parasites by means of the mercury. I might go on with these facts, but what I have referred to is sufficient to convince you that I am correct.

Prof. McLain. May not Dr. Clark have mistaken the effects for the cause? I cannot conceive how a parasite can enter as hard a substance as the enamel. I think the decay must have had a chemical origin. It is merely the effect of chemical action. *Then*, this diseased condition being favorable to the growth of these parasites, of which the most abundant is the *Oidium albicans*, they are found to be present when the decay is examined. There was first a chemical process going on, and then, subsequently, the parasites appear in the place thus prepared for them. In reference to calcification, nature makes an effort to arrest the progress of disease; lymph is thrown out, becomes organized and hardened. If the process is a slow one, calcification is the result. It is thus an effort of nature, *not* the destruction of the parasites, which gives rise to this phenomenon.

Dr. Chupein. I would like to ask Dr. Clark if these parasites exist as well in black as in the white and brown caries. I have noticed that the darker the caries the slower the progress of decay.

Dr. Clark. I am glad that question has been asked. In these investigations my failures were caused by my using that very kind of decay. I could not detect parasites in black decay. If they are there, they must be much smaller than in the brown and white. I have no doubt, however, as to their existence in the black, and we could see them if the microscopes were strong enough to reveal them. The appearance of the parasites also varies with the quality of caries. That these parasites burrow through the enamel is not so surprising, when we remember that the hardest woods, hickory, ebony, etc., exhibit little round holes made by parasites ; so also the coral reefs of Florida. There is no substance so hard that these parasites cannot penetrate.

Dr. Foster. Dr. Clark has not told us that he has seen them burrowing. They exist in saliva, and of course can find their way into pits and roughened places in the teeth. I believe the true agency in producing caries is chemical action,—the secretions of the mouth. They are the real and only cause. Fermentation, which may be seen going on in the mouth, is favorable to the development of these parasites, and after the saliva has to a certain extent undergone this process we find them freely floating in it. They may then become lodged in decay; but I do not consider them the true cause of the decay.

Dr. Walker. I hope we have got nearer the solution of this problem. I have not had the opportunity of making extended investigations upon parasites; but I do know that there is a certain condition of the teeth which indicates the presence of parasites. All the decalcified portion being taken away, little apertures are seen filled with dry powder. This looks as though parasites had worked on it.

Dr. Clark. I would feel unsatisfied if this discussion passed without saying that I am fully aware of the existence of parasites in saliva. They are, however, a very different species from the burrowing parasite. The best article on this subject I have seen is from a German author whose name I do not remember.

Dr. Wardlaw. All of us admit the presence of parasites, but not that they are antecedent to the action of the acids in the mouth. If now Dr. Clark could extract a tooth, and, when the dentine is dried, show the development of these parasites, he would come nearer establishing his point. Carbolic acid is a disinfectant, and acts in this way to arrest the decay. It resists the action of the destructive acids in the mouth.

Dr. McQuillen, having been requested to give his views, said that it was an undecided question whether any of the oral parasites belonged to the animal kingdom.

The following gentlemen were appointed for clinics to-morrow: Drs. Coy, Harris, Johnson, and McLain.

Adjourned.

SECOND DAY—*Morning Session.*

Dr. Atkinson, Chairman of the Committee on Dental Histology and Microscopy, presented his report.

This report was a very elaborate one. The correlations of animal, vegetable, and mineral life were discussed, as seen in corpuscles, cells, and crystals. The report was introduced by Dr. Atkinson with the declaration that it was only an attempt to get at the truth by sweeping away all embryonic windings, even though that truth laid hold upon the throne of God. With some general remarks as to the manner in which the truth should be received, and a tribute to the progress of dentistry, the doctor submitted his report, which was discussed as follows:

Prof. McQuillen, as he had promised the day before, submitted a paper on the subject of Histology and Microscopy, of which the following is a synopsis:

After briefly alluding to the parasites found in other portions of the body, he said: In the mouth of man and of lovely woman, several species of parasites find a place of habitat. Last year and this, such time as I could spare has been devoted to the microscopical examination of them. I have not, however, succeeded as yet in finding the formidable apparatus for boring through the enamel and dentine, claimed to have been seen by some parties. The animal character, indeed, of any of the oral parasites has been questioned. The rapid and apparently voluntary movement which some of them make would seem to indicate an animal nature, but it is exceedingly difficult at times to decide between what is animal and what is vegetable, when examining the lower organisms. Men who devote their lives to scientific investigations learn to be careful in expressing opinions. I incline to the belief that some of the oral parasites are animal. The vegetable character of others is beyond dispute. In accounting for their *origin*, it is not necessary to attribute it to spontaneous generation, since it is reasonable to infer that the germs have been introduced to the mouth either by the air, water, or food. In illustration of this, the *Protococus dentales*, or green fungus, which is so destructive to the teeth of children, resembles very much the *Palamogleea macrococa* of Kutzing, which spreads itself as a green slime over damp stones, steps and walls, while the *Protococus pluvialis*, another plant belonging to the same species, is found in every pool of water, the spores of which must be always floating in the air, as it appears after every shower of rain. The *Leptothrix buccalis*, regarded by some observers as aiding the action of acids in the formation of dental caries, is believed by Haller and others to be one form of *Penicillium*, the commonest fungus found on decaying vegetable substances of all kinds, especially on semi-fluid or liquid matters. Again, the *Oidium albicans*, found in the saliva of persons suffering from *aphthæ*, and which can be most readily obtained for microscopical examination by scraping the aphthous patch with a scalpel, is a fungus growth, probably analogous to the *mehl-thaw*, meal-dew or mildew of corn. Ed. Martin, of Jena, who has devoted considerable attention to the origin of the *Oidium albicans*, infers that *aphthæ* in infants who depend on mealy nutriment is due to the introduction of the parasitic fungus with the food. The origin of the monads, vibriones, spirilla, and denticolæ found in the mouth, is also like the others from without, and they are introduced in the same way. They are like organisms found out of the body, and bearing the same name, with the exception of the last. Ehrenberg described them as *infusoria*, and he asserted that "all true *infusoria*, even the smallest monads, are organized animal bodies." Monads, however, have been claimed by botanists and placed among *volvocincæ*, confervoid, *algæ*, and, as already stated, a doubt has been thrown over the animal nature of the others. The movements of the *Vibrio spirilla*, or "*trembling animalcules*," assuming as they do, a spiral form, and winding their way through the fluid with rapidity, and also that of the *denticolæ*, indicate apparently an animal character.

In connection with oral fluids I would, in conclusion, direct attention briefly to a subject which cannot but interest the dental profession. I allude to the important discovery by my friend, Dr. Jos. G. Richardson, of the "Identity of the White Corpuscles of the Blood with the Salivary, Mucous, and Pus Corpuscles." I do this, not only because it comes within the range of our special observation, but from a conviction that this valuable discovery has not received the general recognition which it is ultimately destined to have. Having on various occasions enjoyed the opportunity of seeing the demonstration under the microscope, by Dr. Richardson, of the identity of the white corpuscles of the blood with the salivary corpuscles, and repeated the experiment myself and obtained the same results, I am impelled not only to accept, but also to advocate his theory. Presenting as it does an interesting subject of investigation to you, I trust that those present who are engaged in microscopic work will, if they have not already done so, devote attention to it. The salivary corpuscles present under a power of eleven hundred diameters "the appearance of perfect spheres varying from the $\frac{1}{1400}$ to $\frac{1}{2500}$ of an inch in diameter, each having a very transparent but beautifully defined cell-wall of exceeding tenuity, which incloses from one to four almost equally transparent nuclei, of a circular or oval form, filled with from twenty-five to fifty molecules, whose characteristic is that of constant and rapid motion." The white corpuscles of the blood as seen in ordinary serum are globular in shape, grayish in color, and decidedly larger than the red disks. On diluting the liquor sanguinis with pure water, the white corpuscles swell up; one, two, or three nuclei come into view, if they were not previously visible, and the cavity of the corpuscle between these nuclei and the cell-wall is generally found to contain a number of very actively-moving particles, the whole putting on in fact the form of the salivary corpuscle. Repeating these experiments, and others bearing upon the subject, over and again, and obtaining each time confirmatory results, Dr. Richardson naturally claims that the identity between white corpuscles of the blood, the salivary, mucous, pus corpuscles, has been fully established; and, taking advantage of Cohnheim's observation of the passage of the white corpuscles of the blood through the walls of the capillaries in the mesentery of the frog, he infers that salivary, mucous, and pus corpuscles are but changed white corpuscles that have "wandered out" of the capillaries, and that the change of form and other characteristics is due to the fluid in which they are immersed. For further particulars on this subject, I would refer you to Dr. Richardson's *Hand-Book of Medical Microscopy*, and to a pamphlet by him, in which the various experiments performed are given in detail.

Prof. Noel being called upon for his views upon this subject, stated that he was not prepared to give that clear and lucid expression of his views on this subject which he would like to do. He stated that he was familiar with the investigations of Ehrenberg, Stricker, Beale, and others. He had looked through the microscope of his friend, Dr. Richardson, to whom he looked as one who had opened up the way in the direction of microscopical investigation to a correct appreciation of the blood corpuscles. In reference to whether these parasites are vegetable or animal, he confessed that he had nothing to say. He stated that he had never thought of this subject logically, systematically, or accurately. He had hitherto regarded caries as a chemical process, by which the mineral base of the tooth was removed, leaving bare the fibrillæ of the dentine. Whether parasites preyed on the teeth by removing molecule after molecule or not, he could not tell. He thanked the association for inviting him to express his views, and promised that another meeting should not find him with ideas on this subject so crude as he had at the present time.

Drs. Winder, Alfred, and Williams were appointed a Committee on Dental Appliances and Improvements.

The association then adjourned.

Afternoon Session.

The discussion of the subject of Histology and Microscopy was taken up, and no one being disposed to speak, Dr. Atkinson said that from his very soul he was grieved to see that the profession appears to fight shy of these questions, and then pretend to have more wisdom than other men. He claimed that dentists were ahead of the world in their development of truth and apprehension of first principles. He was in doubt as to what particular department he should touch upon that would interest them most. It had been required, in the course of the discussion, that a line of demarcation should be set up between animal and vegetable life. Now, as Dr. McQuillen had remarked, "we can be well satisfied as to the difference between an oak and a horse, but the distinction is not so well marked between the lower orders of infusorial life." If the differentiation be traced back to the points where the lines of mergence are very fine, it is very difficult to distinguish between the different kingdoms. Now what is a De Graafian vesicle? Nothing but oxidized carbide of hydrogen, surrounded by a pellicle of the same thing. When the white blood-corpuscle is washed, as Dr. McQuillen had said, the pabulum was washed away by a satisfaction of desire. When the serum is washed away, only a proteinaceous mass is left. At the point where it comes in contact with water, it fails to have the same support that it had before; that is, mechanical support. It feels like an infant just born, and sprawls itself out and takes in water. It then becomes a Brunonian corpuscle, which goes for this sea. This would go on to the formation of the mulberry mass known as pus-corpuscles. A system of systole and diastole is kept up in the giving and receiving water.

Dr. Walker asked Dr. Atkinson to give the association some practical information in reference to forming tissue. He wished to know the proper amount of lime necessary for forming tissue, and the preparation best adapted for this purpose of building up tissue.

Dr. Atkinson said that he was very happy that the question had been asked. Mineral, animal, and vegetable tissue all come through protoplasm, which holds the principles of the three kingdoms in embryo. The mineral comes under the domain of crystallosophy. The vegetable comes under the domain of cellosophy, and the animal under the domain of corpusculosophy. *Corpus*,—a body,—that is what it means. We must understand fully the lines of mergence in order to get at the root of the matter. If a crystal is to be formed, there must be a supernatant fluid, in order to satisfy, as it were, the ghost of the crystal. Now, why do we say that a cell is vegetable? Because it is a center of movements in the absorption, appropriation, transmission, and rejection of pabulum.

How beautifully Bro. McQuillen talked just along here about the washing of the corpuscles! This washed corpuscle, after the water has been taken away from it, is capable of being introduced into the system again, and will perform its round of functions just so soon as it comes in contact with the pabulum necessary for its vital activity. Now, only in animal or vegetable life do we find a shedding of epithelial scales, and a reproduction of like material to take the place of that which, having performed its function, is no longer necessary to the system. Not so with the teeth. A tooth once made is made forever. The conduits of supply and demand are shut off, and there is a cancellation of the periphery of the pulp whenever the serial order is exhausted, and there is no further elaboration of dental fibers. When such things as pulp-stones are found, the cause is traceable to an excess of lime beyond that necessary for the tooth structure, and this excess is precipitated, as having nothing by which its affinities may be satisfied.

The report of Dr. Atkinson was then received.

The Committee on Dental Chemistry being absent, there was no report when the subject was called, and it was accordingly passed without discussion.

The subject of Dental Therapeutics was next called up, and Dr. Wardlaw read a paper on this subject, which was received and passed without discussion.

The subject of Operative Dentistry was called up, and Dr. Clark read a paper taking ground against contour fillings, and advocating the system of Dr. Arthur. The main points in the paper were touched upon in the discussion which followed.

Dr. McQuillen said: In view of the decided condemnation of contour fillings by the author of the essay just read, and the manifest hesitancy or indisposition on the part of those present to discuss the subject, I should feel that I was recreant to duty by remaining silent, and not raising my voice in favor of what are termed contour fillings in cases where they are unquestionably demanded. There is a peculiarity of mankind, not unfrequently manifested by the dental profession, of running to extremes. Twenty years ago large V-shaped spaces between the molars and bicuspids, sacrificing alike the form of the teeth and a large extent of masticating surface, were strongly advocated and practiced by many as the only plan by which such teeth could be saved. Then came the reaction in favor of contour fillings, and those who did not under *all circumstances* introduce such fillings were denounced in unmeasured terms of reproach by most earnest advocates of that method. Another change of base has taken place, and now we are told, by some who a short time ago were most enthusiastic in favor of contour fillings, that it is a plan of practice which should be abandoned entirely, as such operations are invariably unsuccessful, and that under all circumstances where such fillings are introduced V-shaped spaces, with self-cleansing surfaces, retaining the external form of the teeth, but removing a considerable portion of the masticating surfaces of the molars and bicuspids, should be substituted. The assertion that the introduction of contour fillings is invariably attended by failure does not accord with my own experience or observation of the operations of many skillful operators whose work has stood the test of years. That such operations, even when performed with the greatest care, fail sometimes to preserve the teeth is undoubtedly true; but the number of successful cases is in my experience far beyond the failures, and the average of success, as in certain major operations in surgery, is sufficient to warrant the operation. In advocating such operations, it is not as an extremist, but as one who believes in and adopts the eclectic method of practice, doing under the circumstances what seems to be best for the patient. Believing that the Creator of the universe constructed the human teeth in the form best adapted to meet the requirements of the individual, I should introduce contour fillings in those cases where the structure of the teeth, the constitution of the patient, etc., indicated a reasonable prospect of success attending the operations, and, on the other hand, would make V-shaped spaces, with self-cleansing surfaces, when they appeared to be demanded. In conclusion, it is but justice to a young member of the profession, who is present, Dr. M. H. Webb, of Lancaster, to say that from his hands I have seen some of the best work in the direction of contour fillings that has come under my notice. One of his patients is here as a delegate. If such work as that does not save the teeth, operative dentistry is a sham.

Dr. Clark stated that he had seen some contour fillings that looked admirable, but they did not save the teeth. Some of the best of these fillings were put in by Dr. Varney, but they were failures, because the surfaces above the fillings came together. With all my ability and skill, my efforts, particularly with bicuspids, have proved failures. I know Dr. McQuillen's fillings, and some of them are very beautiful, but I tell you contour fillings won't do; you can't keep the teeth clean, and thus preserve them from decay.

Dr. Walker. I am somewhat surprised that here in Baltimore, the seat of the location of the first dental college and of the organization of this association, where there are men who can devise systems upon which to operate,—I say I am astonished to come up here from New Orleans expecting to receive so much light, and find them with their mouths shut as tight as clam-shells. Here are the subjects of Dental Chemistry and Therapeutics passed over without a word, and that in Baltimore. Now, fifty years ago it was customary to find laboratory doors closed, but I thought all these things had been done away with. In order to start the ball, I will relate a case.

He then proceeded to relate the case of a young married couple who, by the use of lime-water,—a spoonful a day,—changed the soft, chalky teeth of their children into hard and strong ones. The administration of lime-water to the mother was manifested in the teeth of the successive children.

Dr. Walker then asked if any one could suggest a convenient and effective form of administering lime.

Dr. Mills stated that he had cured the toothache of pregnancy with lime-water.

Dr. Winder spoke in behalf of Baltimore, and said that, as entertainers, they were disposed rather to listen than to talk. As regards contour fillings, he thought each case should be taken upon its own merits. He was in favor of conservative filling, whatever that may be.

Dr. Arthur. I declined to make any remarks upon this subject because I thought that it was already thoroughly understood. There seems, however, to be a prevailing impression that I recommend the indiscriminate filing away of children's teeth. I never advised this. There are three ways of combating caries: first, the prevention of decay; second, the filling of the tooth; and third, the removal of the superficial decay and the permanent separation of the teeth. In cases where caries of the proximal surfaces is inevitable, then, if the superficial caries can be arrested by removal, why not separate before it occurs? Now some will say it is difficult to arrest caries, it is difficult to determine when it is removed, there is no discoloration, etc. It becomes therefore a very important matter to prevent caries, and every dentist should know, when he sees a tooth, whether it is inevitable or not. A mistake should not be made five times in a hundred. I am perfectly satisfied that in ninety-five per cent. of the cases caries will attack the proximal surface of every tooth, except perhaps the lower incisors and canine. Then why wait for it to take place? If it is true that caries occurs in consequence of close contact, how would contour fillings remedy this? And then again, how many among us are capable of performing these operations? How many of our patients are able to pay for them? We must resort to every means in our power to accomplish the best results under the circumstances, and it does not become us to sneer at any method. If we can't prove a method to be a wrong one, it becomes us to adopt it. If you know it to be defective, it is your duty to bring out these defects. The method I propose is no theory, but simply the result of practical observation. The very best men are adopting it. Now, I am actuated by no ambitious desire in this matter. The time with me has passed when I could be influenced by any personal gratification of this character. I am only desirous of arriving at the best methods for our operations.

Dr. Atkinson then made a few remarks in favor of contour fillings, and criticising the clinical operators for not using the rubber dam and mallet. He also inveighed against the use of wedges, which he said Dr. Varney would persist in using against his most earnest entreaties.

Drs. Palmer, Arthur, Johnson, Hall, McQuillen, and Kingsbury were appointed clinical operators for the ensuing day.

The association then adjourned.

(To be continued.)

AMERICAN DENTAL ASSOCIATION.

First Day.

The thirteenth annual session of the American Dental Association was held at Put-in-Bay, Ohio, commencing August 5th.

The President, Dr. P. G. C. Hunt, in the chair.

After the usual preliminary business, the report of the Committee on Physiology was called for, and the chairman, Dr. M. S. Dean, presented an elaborate paper, after the reading of which the association adjourned.

Afternoon Session.

The amendments to the Constitution lying over from last year were brought up, and all were lost except the following, which were carried:

Amend Art. IX. by substituting, "Alterations and amendments may be made in the foregoing articles or rules of order at any annual meeting by the consent of all the members present. Otherwise, notification in writing shall be made of any such proposed alterations or amendments, and laid over for one year for final action, when they can only be adopted by an affirmative vote of two-thirds of the members present."

Amend Art. VI., Sec. 1, by adding in the proper place the following: "A Committee on Etiology."

Dr. Taft moved that Dr. Dean be requested to re-read his paper on "Physiology," as many had come in since the first reading.

Dr. Dean, however, declined.

The subject of Pathology and Surgery was then taken up, and Prof. Judd read an elaborate report, in which he dwelt largely upon the parasitic origin of disease, and reviewed the works of Sansom, Wedl, Rottenstien, and others.

Dr. Atkinson. I desire to congratulate this body on having among them a man who is capable of presenting such a paper as that to which we have just listened. We have been dealing with function, which means the action of an organ or body. This brings us to protoplasm, where the function of leucocytes and everything else had its birth. Right along here I must dogmatize a little. Protoplasm is proteinaceous substance. I will try to nominate the processes in serial order, and the misapprehensions of observers on this point. We have first *cells* which live in protoplasm. Out of these cells are constructed filaments; these bound together make fascicles, these organs, and these in their functioning lay the foundation of pathology.

Irrigation and desiccation lie at the basis of all nutrition,—I mean water,—H^2O. According to the law of types it is endowed with certain potentialities of tissues, and it may be arrested or killed. If we recognize that red and white corpuscles are agents in function, and that this only occurs in protoplasm, we will come at the truth. The difficulty with regard to the whole question depends on the clear nomination of when we have a mulberry mass or anything else. Now, a surplus of water or dilution lies at the basis of all pathological change. If you place the corpuscles so that water will pass through them, you will observe the globular corpuscles to become granulated. They appear to have nuclei, and around the periphery you see a ring, then another, and then another, until it has expanded much larger than the original corpuscle, proving that there is no pellicle, but the process resembles the throwing off of vegetable spores. If you take them before they burst and desiccate them, you will find the reverse taking place. The granules become fewer until the corpuscle regains its original size. If now we drop it into protoplasm, it is ready with the protoplasm to be converted into tissue. Take the red corpuscles, and you'll get the great result. A corpuscle is a compressed sphere. It looks as though it were nucleated; but if you shift the stage,—which you can better do with Zentmayer's vernier scale,—you will find it perfectly transparent. The nucleus so called is merely a photopic effect. I have here laid the foundation of all pathology. The young corpuscle, as the capillaries weep out normal pabulum for the tissues, comes to the end of the filaments as epithelium, which is metamorphosed blood-corpuscles. Atoms have intelligence,—they are the Master's workmen,—they know exactly how much water they want, how much protoplasm is necessary for their purposes. The brother who read the paper mistook a condition for a cause.

Thursday forenoon was appointed for clinics, and Thursday evening for the election of officers.

The association then adjourned.

SECOND DAY—*Morning Session.*

The minutes of the last meeting were read and approved.

The subject of Pathology and Surgery was resumed.

Dr. Judd. Dr. Atkinson seemed to take pains in correcting my pronunciation of the word leucocytes. He favors the pronunciation leucocy-*tes*. The word is Greek—*Leukos*, white, and *Kutos*, a cell. The Greek plural is *Kutoi*. Anglicized, we have the singular Leukocyte, plural Leuko*cytes*. I was very much pleased with the remarks of the gentleman, but I apprehend that what he said pertained to dead corpuscles. The changes in dead matter are what he described. He is accustomed to apply the term vitality to many phenomena which are not generally considered vital, as the crystal for instance. In regard to the dried or desiccated corpuscle, I do not deem the evidence sufficient to prove that it can be woven into tissue.

Dr. Chase then read a paper on "Alveolar Periostitis," and concluded with some observations favoring the doctrine of spontaneous generation.

Dr. Judd remarked that he had made some examinations in regard to some of the points touched on in the paper, and had come to the conclusion that wherever there was any discharge there was chronic inflammation. In one case, where there was no discharge, by passing a brooch in, he obtained pus-corpuscles. He had used both nitrate of silver and chloride of zinc, but regarded it as almost demonstrated that chloride of zinc was the best. In relation to the fine deposit, he stated that some microscopical observers show the form of the crystals to be carbonate of lime. He thought this was so; whether or not similar to the common deposit, he did not know. In relation to the doctrinal points of the paper, he said that there was nothing of greater interest than the theory of spontaneous generation, or the evolution of the living from the non-living. A century ago it was the general belief that animal forms arose out of dead matter. The maggot was supposed to come from flesh. Redi was the first man to explode this view. His experiments were rude, but sufficient to demonstrate that the maggot did not come from putrefying flesh. It was only necessary to place a net over the flesh, and the maggots did not appear. The contest between both sides of this question has been carried on in every way, until those that believe in spontaneous generation have been driven to the last extremity. In the last few years the experiments of Bastian have been brought forward to controvert those of Pasteur, but they have not succeeded in so doing. Dr. Judd stated further that he did not believe in this doctrine of abiogenesis,—that it was not generally held by scientists, and that it must give way to one more rational and one more in accordance with what we know of the laws of nature.

Dr. Atkinson said that a great deal of confusion arose from false nominations, false interpretations, and want of knowledge. Dead matter! living nonsense! If we knew ontology we wouldn't boggle in this way. The learned gentleman who read the paper used the terms atoms and molecules in the same sense. Molecules arise only out of atoms. If he had said that molecules depended on atoms, he wouldn't have boggled. In regard to what my brother Judd said, I clear myself of all mere dogmatism when I say that I did not mean desiccation in its full sense. I gave it as an opinion that the corpuscle, when reduced to its original size after it had undergone dilution and granulation, might when put into the blood be spun into tissue. However, this is not of importance to us. The thing of great importance is to separate us from our novitiate. Again, I deny what is said in the paper in regard to mercury. Mercury is inert as mercury. In regard to the chloride of sodium crystals present there, they can't stay where there is a current flowing over them to dissolve them. The microscope said that there were crystals of carbonate of lime. There may have been a little chloride of sodium entangled within this; I wouldn't trust myself to say there were not until I had submitted it to chemical tests.

Another point. I see that there is an evident want of understanding in regard to the difference between force and power. Power is generic,—force specific. Power is infinity,—force is a department of power. Atoms are incapable of being killed. Mr. Flagg, a very learned man, claimed to have killed atoms, but we know how that was. Where we get power we have involved all modes of force. Now, these atoms get hungry, and they know exactly when they have enough. These are subjects that ought to interest the very highest intelligences, and men ought to be more humble in pronouncing upon them. There are very many relations under which atoms stand to each other, and an inverted order of these relations constitutes pathology.

Dr. Abbott said that he was very much interested in the paper. In reference to the restoration of the periosteum, he thought this was an impossibility. When once gone, it was never restored. The looseness of the tooth is due to the hypertrophy of the remaining portion of the periosteum. This is kept up by accumulation of tartar, which is carbonate of lime. In all diseases, if we remove the cause we control the disease. Is it necessary, then, to run chloride of zinc, etc., up there? Isn't nature ready to do the work? I think so. I never found a case in which it was necessary to use it. If you stick a splinter anywhere in your body, what is the cure for it? Remove the splinter; take it away; don't put on nitrate of silver, but leave it to nature. Now, in this case, remove the tartar and nature will effect the cure. Keep it disinfected with a weak solution of carbolic acid. Dr. Riggs's treatment is to run under the gum and cut away the dead portion. You may get a restoration of the process, but not of the periosteum,—the tooth gets hard and solid, and nothing more. The strength of carbolic acid I use as a disinfectant is one drachm to eight ounces of water. Chlorate of potash acts better.

Dr. Walker said that after removing the tartar a solution of equal parts chloride of zinc and water, and then on another day a preparation as follows:

℞.—Carbolic acid, ⅓ ʒ;
Iodine, ⅓ ℥;
Glycerin, 3 ℥.

Dr. Osmond gave the following preparation:

℞.—Potassii chlorate, ʒij;
Tinct. arnica,
Tinct. myrrh, āā ʒiv;
Aquæ rosæ, ℥vj.
Apply five or six times a day.

Dr. Morgan said that every disease should be treated on its own merits. General principles furnished the only philosophical guide to practice. Whenever we deviate from this to prescription practice, we become an arrant set of empirics. Sometimes we want stimulation, and again a reduction of the vital force. The gentleman said that periosteum is never reproduced. I think it is very frequently reproduced. I don't know that it is ever on the root of the tooth, but I know it is elsewhere.

Dr. Herriott thought the periosteum could be reproduced. If not, he could not see why teeth get so solid as they do. In many cases he thought heroic treatment was resorted to when it was not necessary. Homœopathy had done a great deal of good by reducing the doses of those in the regular practice, though he was no *little-pill* doctor himself. Where the nerve was left all right, he repeated that he thought the periosteum could be reproduced.

Dr. Osmond suggested that if the pulp were not already dead, such treatment as that proposed would kill it.

Dr. Judd. I arise to correct a misapprehension. We are not discussing a common case of impaction of tartar. There is no impaction of tartar. It requires a microscope to distinguish the crystals. This case is entirely different,—very much more rare. We are all very well aware that in a common case of impaction of tartar the removal of the tartar is all that is necessary. But I want to call attention to one fact,—there are certain diseased conditions in which the cause has passed away before it has come under our observation. They have become chronic, as when inflammation exists, and continues to exist after the cause has passed away. We see this in the diseases of the throat, nasal passages, and other mucous membranes. We need something to stimulate the vessels to resume their normal caliber.

Dr. Buckingham said that the remedial action of chloride of zinc and carbolic acid was the destruction of the parasites, thus getting rid of foreign matter.

Dr. Stellwagen said that Dr. Chase did not go into the action of these agents, because he presumed every gentleman knew that the object was to constringe the surrounding parts and get rid of the parasites.

Some sporadic discussion then arose as to the use of the word periosteum. Dr. Judd closed it by remarking that cementum was true osteal structure. Peridonteum belonged no longer in this world nor to that which is to come. Cementum is bone.

Dr. Chase said that in speaking of molecules he was referring to organs; of atoms, to inorganic substances. He was surprised that the case he referred to was construed into a common case of impaction of tartar. He didn't know whether the periosteum was living or dead, nor did he care, as he knew the teeth would live without it. He couldn't tell without extracting the tooth. He then went over the well-known experiments of Bastian, Pouchet, and others, to prove spontaneous generation,—subjecting an infusion of hay to 212° Fahrenheit, then suddenly seal with mastic, and after this germs make their appearance.

Dr. Judd answered this, by stating that certain germs could live in a heat far beyond 212°, and grow. It was once thought that mercury would destroy them all, but it was afterward found that many lived as well in mercury as elsewhere.

The association then adjourned.

Afternoon Session.

The subject of Dental Pathology and Surgery being called up, Dr. Stellwagen remarked that after inflammation had set in, he would defy anybody to show any line of demarcation between the pericementum and the periosteum.

Dr. J. S. Smith called attention to Wedl's distinction in terms,—he called that which covers the root the *root-membrane.*

The Committee on Arrangements announced clinics for the ensuing day, from half-past eight to twelve o'clock, as follows:

Diagnostic Clinic, Dr. Atkinson.

Operative Clinic, Dr. Corydon Palmer.

Operative and Diagnostic Clinic, Dr. Butler.

Dr. H. L. Sage then presented the report from the Committee on Therapeutics. The main subject dwelt upon was Carvacrol—its action, composition, etc.

Dr. Atkinson. I want to make just a few remarks in regard to the glycerol of thymol. It has been objected that it produces great pain. Now this glycerin being made up of carbon, hydrogen, and oxygen, has a strong affinity for water; and it takes the water of the tissue. That is why it produces such shocks. I have objected to thymol pure, which gives no shock to the system by its application, because it has to be brought to a high temperature for application. These points are of value to us. How shall we make the glycerol of thymol valuable to us? It brings the thymol in contact with the tissue in a finely divided condition, and we have its disinfecting properties and its destructive power over parasites. I indorse the use of carvacrol,—in fact of all these carbol series, for they all act as disinfectants. In reference to molecules again: there are two agents as atoms in a molecule of water, and there is something in these,—the force of affinity which is brought to bear upon them. This force is the high-priest that marries them, and they assume a form dependent upon the number of bonds of affinity.

My first love was creasote, then came along thymol and then carvacrol. In regard to pepsin, I would say it does not dissolve anything.

It stands as a force,—an active principle, enabling the water to discharge the albumen. The method of using it I indorse. I also use phosphoric acid along with it.

Prof. Taft. In regard to carvacrol, I have been experimenting with it for some time, and in many cases have been exceedingly pleased with it, though it is not alike efficacious in all cases. The subject of therapeutics is of very great importance,—one in regard to which there is perhaps as little knowledge among the profession as any other. Very much of the practice of dentistry partakes of the practice of medicine. How many men here but confine themselves strictly to mere manipulation? Few enter on the subject of treatment as they ought.

Prof. Taft concluded by exhibiting to the association a convenient form of medicinal preparations in gelatin rolled out into squares and crossed so as to indicate the quantity of medicine contained in the limits prescribed. He recommended this for dentists as getting rid of formulas, with which many were not from the nature of the case familiar. He showed a case of these preparations, put up in Cincinnati for one dollar, that could be carried in the pocket.

Dr. Rehwinkle thought the profession greatly needed a hand-book of materia medica. He moved that a committee be appointed to investigate the action and properties of carbolic acid, creasote, thymol, and carvacrol. This motion was carried.

Dr. Atkinson. There is an invention by Dr. J. B. Wingate, of Carbondale, Pa., for the treatment of alveolar abscesses, which I like very much. It consists of little cups of different shapes to apply to any part of the mouth, by which you can get either dry or wet cupping. An air-pump is attached to the cupping-glass. It affords great relief in local congestion, and is perfectly under your control. Many alveolar abscesses in pulpless teeth are aborted by this. It is much more convenient than the use of leeches.

Dr. Stellwagen said that he had gone back to the simple alcohol, and found that it would answer all purposes. It is a good bleacher and cleanser, and was in every respect as good as the other preparations which had been suggested.

The subject of Histology and Microscopy was then taken up, and Dr. Hitchcock presented a report, showing photographs of various preparations which he had made.

[After the reading, Dr. Eastlack, of Shanghai, China, was introduced, invited to a seat on the floor, and requested to give an account of the practice of dentistry in China at the ensuing session.]

Prof. Judd. I am not willing to allow this subject to pass by without any remarks having been made upon it. I scarcely care about anything mentioned in the report but the subject of new formations.

This should be fully discussed. These formations are sometimes continuous with the dentinal structure projecting into the cavity containing the pulp, and in other cases within the pulp itself. Not only do they occur in the crown, but also in the fangs. There is some variation in the structure of these formations, and, contrary to my expectation, I think that we do find in those projecting into the pulp itself a more near approach to dentine than those that seem to be a mere continuation or prolongation of the dentine. I found five or six or seven of these, one or two of which had dentinal tubules fully developed. Until the last two months I have seen comparatively few, and those simply calcifications, without the development of a single tubule.

An examination of the formations referred to showed the dentinal tubules as direct and perfectly formed as in the healthy tooth. The influence which these formations produce on surrounding tissue is interesting. Prof. Garretson says that they are among the causes of neuralgic troubles. Several cases have come under my observation which I think very likely are due to this cause. There was one eight or nine months ago in the mouth of a physician in St. Joseph, Mo. He had suffered with neuralgia in the head and face until the physicians had declined doing anything for him. They sent him to St. Louis, and thought he would die. The case was discussed by myself at the State Association in St. Louis, and I suggested that it was due to the teeth.

Another case of a young lady came into my own hands. She had been under the physicians for four years. She complained of excruciating pain in her head, the pain of a lancinating character. She was sent to my office for me to examine her teeth. I could find nothing to lead me to pronounce definitely upon the case. I found in the upper and lower molars, on percussion, a slight sensitiveness. I extracted the tooth, in which I found no cavity. To all appearances it was healthy. I split it open, and found the pulp one mass of calcified material. I extracted the lower tooth, and the pain almost at once subsided.

Prof. Taft. Would it not have been better to have opened the tooth?

Prof. Judd. I preferred extraction. I would say further that if you would examine healthy teeth from the dead-house you would find frequently nodules of secondary calcified matter.

Dr. Hitchcock. You are very likely, in the cases referred to, to find the cementum increased on the root.

Dr. Morgan. What Prof. Judd has remarked in regard to the frequent formation of secondary calcification is true. It frequently occurs in several specula or nodules. In all those cases the character of the neuralgia differs from that which arises from causes located in the outer walls. It is more lancellating. Occasionally I have seen an increase of cementum on the root.

Dr. Atkinson congratulated the association on having men who could make such observations as these. He thought the cases of calcification referred to indicated a return to lower types. He said he had seen cases of long continuance where the mastication was not sufficient, and the patient did not sleep with his mouth shut. The size of the pulp cavity was reduced, and, while the circulation was not really interfered with, the space of action was lessened. He had seen the pulp hanging in strings, leaving only a few fibres with the calcified material hanging to it. He indorsed the normal method of removing a section and filling up the pulp chamber.

Dr. Keely criticized Prof. Judd's use of the word *fang,* instead of root.

Prof. Judd replied that he never saw any objection to the use of the word. It is from the German, *fangen,* to grasp.

Dr. Rehwinkle said *fangen* meant to grasp like the creepers of the ivy,—not to penetrate; *wurtzel* was the word for root.

Prof. Judd replied that it came as near the original in its application as most derivatives, which very frequently receive their application from only a single property.

Dr. H. A. Smith. A case came under my observation bearing on this subject, which I will relate. A young man suffering excruciating pain had been under the treatment of a homœopathic physician, for neuralgia, and finding no relief, applied to me. I examined the teeth of the lower jaw on the right side, and found a filling on the grinding surface of the six-year molar. I removed the filling and struck upon a stratum of ossified substance. Not being satisfied that the pulp was healthy, I penetrated into the cavity, and the gases evolved satisfied me that the disease was brought about by the gases pressing on the pulp. These cases should induce medical men to be more careful in their diagnosis.

Dr. Chase mentioned a case in which osteal cells were discovered by him at the large end of dentinal tubes.

Upon this point there was some little conversational discussion from the seats, which was non-reportable.

After being called to order, the association adjourned.

(To be continued.)

AMERICAN DENTAL CONVENTION.

FIRST DAY.

THE nineteenth annual meeting was held in the Town Hall, Saratoga Springs, August 12th, 13th, and 14th.

Opening Session.

The Convention was called to order at 11 o'clock by the President, Dr. I. J. Wetherbee, of Boston, and was opened with prayer by the Rev. E. A. Woods.

The welcoming address was delivered by Dr. J. G. Ambler, of New York City, in rhyme.

The address by Dr. C. A. Marvin, of Brooklyn, on behalf of the Dental Society of the State of New York, was a mixture of humor and sober truth, and well delivered. He spoke of the State Society as being founded on the idea that a profession is something more than a trade,—that however skillful an artisan a man may be, he is none the more a professional man on that account. The professional element is an entirely different matter. A man who can fill a tooth well is not a doctor any more than he who, quite as ingeniously, inlays your seal-ring with blue enamel. What is a doctor? A teacher: one who teaches, or can teach, the principles which underlie every act of his which pertains to his calling,—who works with his mind before and while he moves his hands. Not so an imitator; he cannot teach. The line is to be drawn some day; and the day will soon come, and the touchstone will not be *charges.*

Addresses were also delivered by the Rev. J. M. Ring, of Saratoga; Dr. T. B. Reynolds, of the medical faculty of Saratoga; and the opening address by the President, in which he alluded to Darwin's work on the *Origin of Man*, ably criticising it, and refuting many of that author's theories.

Afternoon Session.

The Constitution was read and signed, and an assessment of two dollars made upon each member. The President, in a short address, referred to the advancement the profession is making in useful knowledge, there being a corresponding increase in professional ability. Our dental colleges have played an important part in the diffusion of scientific knowledge, the alumni of which are among the most prominent and popular leading dentists both here and in Europe. This work has been most nobly achieved through much trial on the part of those engaged in dental teachings, whatever may have been the expressed views of one who came across the "great ferry," to see what he could see rather than to have things shown to him. His criticism on the character of teachings in our dental colleges is as invidious as it is unjust, and chiefly so from his want of familiarity with and knowledge of its extent. While some of our English brethren are diagnosing a case, we cut a man in pieces, put him together again, and union by first intention is sure to follow.

Dr. Wm. H. Atkinson then read a paper on "Pathology and Therapeutics."

Dr. John Allen said that disorganized substances taken into the stomach as food are not appropriated in the system as organized ones. Grains—such as wheat, barley, or rye—in organized forms will make tissue; but when disorganized by fermentation or distillation, they do not then form tissue. It is a fact well attested by chemists and scientific men, that alcohol is wholly useless in forming tissue, and it does not give strength to the human body. Take a man in ordinary condition; let him stand upon a lifting-machine and exert his whole strength in lifting, and note the figure at which the needle points. Then let him take a drink of brandy, and in a short time lift again. If the brandy gives additional strength, he will bring the needle higher; but the fact is, the needle indicates a lower figure. Still another drink, and the needle will fall still lower. He fancies himself still stronger, but it is a delusion; it is only a temporary stimulant. Continue to give him more liquor, and he becomes so weak that he cannot walk. Alcohol is supposed also to impart heat to the system. Place the bulb of a thermometer at the root of the tongue and note the degree. Then let the person drink spirituous liquor; after which again place the bulb upon the root of the tongue, and it will be found that the mercury will indicate a lower temperature.

Dr. Bonwill said that one of the best evidences that alcohol undergoes no changes after it has been taken into the stomach is that when the saliva, urine, and perspiration are tested by the bichromate of potash, the alcohol is found in as pure a state as when taken into the stomach; no loss to it, and no gain to the tissues, but rather weakening by over-stimulation. As to whether inorganic bodies can be appropriated to the making of tissue, except through organized bodies having first taken them up through the soil, it was once believed to be the only cause; but late experiments have proven that the soluble phosphates, or any of the elementary inorganic substances making tissue can be converted into tissue, or, at least, add their quota of nutriment, if first brought to the soluble state by chemical action.

Dr. Atkinson said, in relation to the direct effects of the various kinds of iron, when taken into the system, that all elements that go into the system must be soluble or finally divided. Sea-foam is the beginning of all vegetable and animal bodies. Sea-foam is made of water, holding chloride of sodium in solution, acted on by air, and is formed by this water dashing against rocks. Chloride of iron, which is made up of iron and proteinaceous mass (C,H,N,O), gives the red color to the corpuscles, and is the only iron we know of which is appropriated by the blood-globules. The presence of the iron is the principal cause of the color of the red corpuscles. The iron, in infinitely fine divisions, forms magnets; the polarization and depolarization of these magnets constitutes the diastole and systole of the red corpuscle. The sole use of the red corpuscle, as red corpuscle, is to carry oxygen to the blood-mass in the vessels, and into the intercellular spaces, so that the oxygen may oxygenate.

It was announced that clinics would be held from 9 to 11 A.M., and regular sessions from 11 A.M. to 1 P.M.; and also from 3½P.M. to 6 P.M.

SECOND DAY—*Morning Session.*

Dr. A. Lawrence, of Boston, on invitation of the Convention, showed an interesting experiment, to prove that amalgams do not shrink after being placed in the cavity of a tooth. He exhibited several iron capsules, which were filled with his amalgam in precisely the same manner as he would fill a cavity in a tooth. He said that mercury, whether pure or mixed with other metals, in passing from a fluid to a solid state decreases in *specific gravity;* hence it has been supposed that a decrease in *bulk* results. But such is not the case so far as bulk is concerned. It does decrease in specific gravity, but increases in bulk, just as is the case with water. He referred to an experiment in which a test-tube is partially filled with water; then a filling of amalgam is inserted, more or less imperfectly according to the result desired. Ink is then poured into the top of the tube, above the filling, and a lamp placed beneath, and the passage of the ink by the filling into the water is regarded as a proof of contraction. Any one can readily understand that the heat of the lamp expands the glass tube, and the ink may descend as a matter of course. He thought the contraction of the amalgam similar to the contraction of a cart-wheel to receive a red-hot tire.

The apparatus for testing the amalgam was substantially as follows: He had a small force-pump, such as is used in testing steam-boilers, with two outlets, to one of which a steam-gauge, registering one thousand pounds to the square inch, was attached, and to the other the capsule containing the amalgam fillings, five or six days old. A tincture of iodine was poured into the capsule, above the filling, and the end of the tube containing the amalgam was inserted into a solution of starch, the well-known test for iodine. The force was then applied, and carried successively to 100, 200, etc., to 1000 pounds, and none of the tincture of iodine was forced through under this immense pressure of $66\frac{4}{15}$ atmospheres to the square inch.

Dr. John Allen, of New York, then read a paper on "Artificial Dentures." He proposed to dwell more in this paper upon the causes of failures of artificial dentures to answer the purposes of substitutes for the natural organs. He spoke of the difficulty experienced by the young mechanical dentist in mouths where portions of the gums are soft and portions hard. He also referred to other difficulties apt to be encountered, and gave the method of overcoming them. In most cases, when the teeth are closed, there should be a free margin between front, lower, and the upper teeth, including the cuspids. The bicuspids and molars should be perfectly articulated to secure a good practical result, and more especially if the lower teeth are artificial. The length of the teeth should depend upon the width of the lips that are to cover them and the degree of absorption of the alveolar ridge. As a general rule, the front teeth should be long enough to display their points—a little below the upper and above the lower lip—when in their natural position. "It is the height of art to conceal art." The dentist who is a true artist is not ambitious to have his work bear the impress of artificial teeth. In many persons the natural expression is almost lost, and distortion has taken the place of symmetry. Persons of bold and strongly marked features require prominent and irregular teeth; and those having a small visage should have small, convex teeth; and those having a broad, full face should have large teeth, with but little convexity. In order that artificial teeth may be used for mastication, they should be placed upon the plate, and articulated in such a manner as to cause the pressure in chewing to come upon the inner rather than upon the outer margin of the alveolar ridge. If the muscles of the face have become sunken, they should be brought out to their proper position by means of prominences formed upon the denture, of such shape and size as to meet the requirements of the case.

The principal muscles in the front part of the face are the zygomaticus minor, levator labii superioris alæque nasi, and orbicularis oris. These rest upon the front, canine, and bicuspid teeth, which, when lost, allow their muscles to sink in, thereby changing the expression of the mouth. The insertion of the front teeth will, in many instances, bring out the lips; but there are two muscles in the front part of the face which cannot, in many instances, be thus restored to their original position. One is the zygomaticus minor, which arises from the front of the malar bone, and is inserted into the upper lip above the angle of the mouth. The other is the levator muscle, which arises from the nasal process, and from the edge of the orbit above the infra-orbital foramen, and is inserted into the alæ nasi, or wing of the nose, and upper lip. If these muscles have become sunken, they should be raised by forming prominences upon the denture over the cuspids, of such form and size as will bring them out to their natural position.

The muscles situated upon the sides of the face, and which rest upon the molar or back teeth, are the zygomaticus major, masseter, and buccinator. The loss of the back teeth of many persons causes these muscles to fall in. Here much larger prominences should be built upon the denture, of such shape and dimensions as to restore the cheeks tc their former rotundity.

In the construction of a musical instrument with reeds or tongue, the most perfect adaptation of the surrounding parts is necessary, in order that each note should have a round, full, and clear tone. The slightest defect in this respect throws the instrument out of tune, and discordant notes are the result. So with the human voice. In order that the notes and words be clear and full, a perfectly natural form should be given to artificial teeth and gums, that they may be properly adapted to the tongue. If a denture is so constructed as to be unnatural in form, the tongue will not play upon it so as to produce distinct enunciation. Hence the muffled or hissing sounds which are often observed in public speaking, singing, and conversation.

Before discussing this paper, it was resolved that the other essays should be read.

Dr. G. A. Mills, of Hartford, Conn., read a paper upon "Salivary Calculus." He regarded the deposits as the results of disturbed functional action, producing abnormal conditions both of mucous and salivary secretions. What is termed general debility is conducive to this deposit, and the increased accumulation of it a source of the rapid downward tendency of the tonicity of the whole organization. There are frequent cases when the state of health has fallen so low, aggravated by these deposits, that the simple removal alone will cause a rapid return to a higher grade of health. All who have a fair amount of observation and understanding will, if they notice the variety of cases that come under their care, see that the conditions that present themselves are decidedly against the functions of digestion. The cases are of no uncommon occurrence that leave the hands of some of the representative men of our profession with the crowns of the teeth well cared for, while the necks of the teeth, and margin of the gums, and often the sockets, are in a diseased condition. On the part of the patient, there is a prevailing idea that there is no remedy, an idea too often encouraged by the practitioner. It is often said to be hereditary, constitutional; so is all disease, more or less. Thoroughness in the removal of the deposits is the great requisite; and then, by the assistance of local stimulants in some cases and constitutional remedies in others, we can expect success.

Dr. D. F. Drake, of Boston, Mass., read an essay on "Orthodontia." He thought that orthodontia meant something more than the mere application of appliances to the teeth to throw them into their proper position. The conditions to be desired are,—1. Youth or proper age; 2. Health of the parts; 3. Absence of syphilitic taint, hereditary or otherwise; 4. Absence of scrofula or struma; 5. Absence of all scorbutic tendencies; 6. Absolute cleanliness; 7. Confidence of patient. All these conditions being favorable, success is certain. Remember that the simplest method is always preferable. With the appliances nicely adjusted and carefully watched, the carrying of the teeth to their proper position is an easy matter. This must be done neither too fast nor too slow, for either will jeopardize the operation. There is little danger of moving too fast if it is done steadily. A steady, firm pressure will provoke much less inflammation than an unsteady, oscillating movement. Move the teeth as fast as it is possible without injuring the pulp. It is quite common for children to inherit large teeth from one parent and small maxillæ from the other. In such a case an enlargement of the maxillæ must be obtained, but not until the majority of the second teeth have made their appearance. This contraction of the maxillæ is almost invariably associated with irregularities of the teeth. I have had within the last two years no less than twelve patients, from fourteen to thirty-six years of age, who have retained their first lateral teeth without any appearances of the approach of the second; have invariably removed them, and immediately the second commenced to advance.

Following a brief discussion upon various matters, Saratoga was determined upon as the place for holding the next meeting, in 1874.

Afternoon Session.

Dr. C. S. Hurlbut, of Springfield, Mass., read an essay on "Kindness to our Patients," in which he urged the importance of a dentist being both a teacher and a physician. A smiling face, and hopeful, pleasant words, should accompany every operation. The essay was well received, and adopted as the sentiments of the Convention.

Dr. Ambler Tees, of Philadelphia, read a paper on "Continuous Gum Work." He spoke of the improvements made in this style of work during the last few years, commented upon the objections urged against it, and gave the following instructions in regard to making it. Since the body and gum are manufactured by Dr. Allen for the profession, it will not be necessary to give the formulas for making them. The body now sold at the dental depots fuses at a much higher temperature than that which was in the market originally (the process for making which is given in Harris's text-book), and excels it in strength in a marked degree.

The impression is taken in the ordinary manner, and the plate swaged with a rim. The platina used is about the thickness of twenty-eight, easy, American gauge. The lower plate is double, with the exception of the rim, and soldered together with pure gold. The articulation having been taken, the teeth are carefully ground on, and made to touch the plate; this will serve to prevent the teeth from changing position, and the plate from warping, through the shrinkage of the body. The piece is then imbedded in equal parts of plaster and asbestos, thoroughly mixed with water. On hardening the wax is removed, and a continuous band, fitted against the teeth, closely burnished against the plate, and brought well up under the long pins, which are bent down over it. No holes should be drilled in this band, nor should the plate be scraped in any manner. By boiling it in sulphuric acid and cleansing it well, the body will be found to be sufficiently tenacious.

The pins are then soldered to the band, and the band to the plate, with pure gold. To obviate what is termed etching of the teeth, caused by the fusion of the enamel with the plaster, three methods may be resorted to: 1st, by soldering with a blow-pipe; 2d, by coating before investing with thick shellac varnish; and 3d, by soldering in the furnace and removing the piece the moment the gold flows. To do this it must be examined frequently while in the muffle. This last plan is the one I prefer.

After removing the plaster and washing well with soap and water, the set may be, if desirable, tried in the mouth, and if any change is necessary in the position of the teeth at this stage, it can very easily be done; but if care has been exercised in the manipulation, they will generally be found to be in their proper positions. The case is now ready for the first coat of body. This is put on with a small, flat, acute-angled spatula. It is mixed with clean water to the consistence of soft putty, and packed closely, care being taken not to allow it to run between the points of the teeth, especially when they approximate. It is then so carved that when the set is finished the lights and shades of the natural gums may be imitated. Upon the skill exercised in doing this depends in a great degree the accomplishment of beautiful results. Camel's-hair brushes, cut short, are used in removing particles of body on the surfaces of the teeth; and this being done, it is ready for the muffle.

A small-sized furnace is sufficient for the purpose of fusing or baking, since, to insure success, no more than one set should be baked at a time. Coke, about the size of small stove coal, should be used for fuel. When the fire is thoroughly kindled under the muffle, more coke should be put on, and by means of a poker made to envelop the muffle, reaching to the bottom of the door of the furnace. The inside of the muffle will then be dark. The set is then placed on a small fireclay slide, with the points of the teeth upwards, at the mouth of the muffle, and gradually moved in, until the back part is reached. About thirty minutes of time is consumed in doing this. If these directions are carefully observed, neither scaling of the body nor warping of the plate need be feared. The muffle and furnace doors are then closed, and the full draft allowed. It generally requires an hour from this time to bake it sufficiently. It must be fused but slightly, and present the appearance rather of an accumulation of shining crystals than the smoothness of glass. A muffle of the temperature of the room is used for cooling; the piece is placed in it, and allowed to remain about an hour. A second coat of body is then put on, the shrinkage of the first making it necessary. It is carved in the same way as the first coat. If an upper set, the lingual surface of the plate having been coated, the rugæ may now be imitated. When ready, it is baked exactly in the same manner as before.

On cooling, it is then ready for the gum; this is laid on about the thickness of twenty-six plate, making it a little thicker where the depressions in the body were carved for the dark shades. Experience, with patience and the necessary talent, will soon make an expert of one in this part of the work. The furnace is fixed in the same manner as for the body. The case is gradually moved forward until the end of the muffle is reached. The door of the furnace only is then closed, the teeth are allowed to get red hot, when the slide is brought back to within three or four inches of the mouth of the muffle, and kept there until the highest heat is attained. It is then pushed again to the back part of the muffle, and the door closed. At the end of ten minutes, if the heat is properly managed, the teeth are withdrawn and placed in the cooling muffle, where they should remain at least twelve hours.

In making an upper and a lower set, the lower set should be finished before investing the upper in plaster; if any change has taken place in the position of the lower teeth, the upper ones can then easily be made to articulate again correctly with them. The gum is very often cracked and otherwise spoiled by not having the heat high enough. Care, therefore, should be taken that the furnace be kept free of clinkers and put in the very best place for a draft. The coke should be of a uniform size, and the muffle, as soon as cracked, should be removed and a new one put in.

Dr. A. M. Dudley, of Peabody, Mass., read a paper on "Oxychloride and its Uses." He referred to the different properties of zinc and its oxide, and gave the honor to M. Sorel, a chemist of Paris, of discovering the oxychloride of zinc, which he announced in 1855 to the French Academy of Sciences. All the materials in the market he pronounced simply the oxide and chloride of zinc, made after different formulæ and more or less adulterated according to the whim of the manufacturer. A cheap laboratory article can be made by taking a pound of the best French oxide, which can be procured of the wholesale dealer in painters' supplies, mixing with it two ounces of finely pulverized silica, and placing it in a crucible and calcining it at about a red heat for five minutes. Allow it to cool, and keep it in an air-tight bottle to prevent it from absorbing moisture. To make the liquid, take an ounce of granulated chloride of zinc, pulverize, and dissolve in about an ounce of water. He regarded the filling of the pulp canal and roots of teeth with cotton saturated with oxychloride as highly objectionable, because of the difficulty of impacting the cotton and the danger of forcing the chloride of zinc through the foramen at the apex of the root, and causing inflammation and death of the periosteum. He has also been very successful with it in bleaching teeth, by filling the cavity first with oxychloride under the enamel and finishing with gold. He objected to its use in capping pulps. He said he had capped sixty-five exposed pulps with the preparations in the market, and had found dead pulps in two-thirds of them, and expected to find them in more. Since making his own oxide and chloride he had met with better success, on account of its being free from chlorhydric acid, lead, and arsenic. According to Elliott and Storer's analyses of the different kinds of zinc in the market, that made by the Penn Zinc Co., at Bethlehem, Pa., is the only kind free from lead and arsenic. It is the kind used by chemists in analyses. Make your oxide from pure metallic zinc. Make your chloride from the same zinc, by solution in hydrochloric acid, purified of all trace of arsenic, and you have the only zinc cement that is fit to use when the decay is in close approximation to the pulp. On account of its powerful escharotic action, you can never have good results with it in capping exposed pulps. For the treatment of the pulp previous to capping, he referred to the able and exhaustive paper upon the "Conservative Treatment of the Pulp," by Dr. Louis Jack, of Philadelphia, published in the DENTAL COSMOS, and indorsed his treatment. He condemned the treatment of exposed pulps, by sopping with creasote, and filling over with oxychloride; he said that Dr. Atkinson, of New York, had said and written more upon the subject in its favor than any one else, and is more responsible for the wide-spread and indiscriminate use of it for capping pulps than any one else. He spoke of a new material for capping exposed pulps. It is a combination of magnesia, silica, and alumina. It is called the oxychloride of magnesia. It is sedative in its action; is antacid, a non-irritant, and a non-escharotic. It will make the whitest and hardest of all cements. It is applied in the same manner as the zinc cement, but requires two or three days to acquire a sufficient degree of hardness to receive a gold-filling over it. It can be prepared by any dentist possessing a little knowledge of chemistry. The true artist is he whose teacher is nature, and who strives to follow closely her precepts. God speed the day when we shall possess a material for filling teeth which will enable us to attain the durability, form, and color of the natural teeth!

On motion, the convention proceeded to the election of officers for the ensuing year, which resulted as follows:

President.—Dr. John Allen, of New York City.
Vice-President.—Dr. B. F. Coy, of Baltimore.
Recording Secretary.—Dr. C. S. Hurlbut, of Springfield, Mass.
Corresponding Secretary.—Dr. Ambler Tees, of Philadelphia.
Treasurer.—Dr. J. G. Ambler, of New York City.

Dr. John Allen's paper was then discussed.

Dr. Ambler congratulated Dr. Allen upon the character of his paper. It is a repetition of his dental life. The credit belongs to him of perfecting continuous gum work, which is the perfection of artificial work to-day. He regarded the progress of artificial dentistry since 1856 as being backward, caused by the demand for low-priced dentistry. Patients say they can have half a dozen sets on rubber where they can have only one on this plan; but he would state, as his candid belief, that setting teeth on rubber proved good by giving dentures to those unable to pay for something better. Dr. Allen's plan has the advantage over other styles, that it can be adapted to age, expression, etc. That many people wear false teeth is plainly discernible, the same moulds being put in the mouths of young and old, making one feel sick at heart to see such substitutes for nature. In 1832 the necessity was seen of having no seams in the gums, and experiments were then made in this direction. Teeth were baked upon a narrow ribbon of platina and mounted on gold plate. Dr. Ambler gave his own experience of the difficulties encountered in the manufacture of artificial teeth when a student in his uncle's laboratory, nearly forty years ago.

Dr. Atkinson stated that Dr. Allen had given continuous gum work to the profession, but not until within a year or two of the expiration of the patent. It would have been better for him to have prepared the material, sold it, and charged for instruction, and thus have got his profit. Had he thus given it freely, we would not have had rubber, with its attendant disastrous results. Had he compromised with Dr. Hunter and taken the course suggested, he would have made a fortune, blessed the world, and the profession would have been higher this day by many degrees. Rubber tempted people to have good, sound natural teeth taken out of their mouths, and have miserable substitutes to their lasting detriment. What would rubber work have been without the knowledge and skill of dentists, who worked it up to completeness? A failure patent to every one. Continuous gum work would be cheaper than rubber, even for a servant girl at twelve shillings a week.

Dr. Allen defended the course he had taken in relation to his patent. The defense of it had cost him all he had made in twenty years, and twelve hundred dollars besides. He said that not one in a thousand could make this work without practical instruction. He gave an instance of the deleterious effect of rubber upon the mucous membrane of the mouth of a lady of refinement. The whole roof of the mouth, palate and all, sloughed off. There was a loss of nervous power, and perpetual salivation; the organs of the mouth were scarcely able to perform their natural functions; result at last, death. This lady was disposed to mercurial action. Some years before wearing the plate, she had had fever, and had been salivated. In consequence of susceptibility to its action, the rubber brought it on again. Previous to wearing it the mouth was in a healthy condition. He could name others, though less aggravated.

Dr. Hurlbut said he had been called upon to inspect an artificial set of teeth on gold plate. The plate was completely covered with mercury. He supposed the plate might have extracted it from the system.

Dr. Lawrence said that he inserted some teeth on a good piece of gold plate for a lady. She returned in course of time with the plate white (leading him to suppose she had taken mercury), and charged him with being dishonest. She said it was poor gold, and that he must make her another set. He took it into the laboratory and polished it; the white came off. He then asked her what she had been doing with the teeth? She said she had cleaned them in a tin dish with boiling water. He supposed there was a galvanic action between the tin and gold, causing a deposit of the tin upon the gold plate.

Adjourned.

(To be continued.)

ILLINOIS AND IOWA STATE DENTAL SOCIETIES—JOINT SESSION.

THE Illinois State Dental Society convened for its ninth annual session, at Rock Island, and the Iowa Society for its eleventh annual session, at Davenport, May 13th, 1873.

After the transaction of some individual business, the two societies met at Davenport for discussion, clinics being held at Rock Island.

The joint session was presided over alternately by the presidents of the two societies, and it was agreed that the secretary of the Illinois Society should edit the proceedings of the joint convention.*

After some preliminary business, an essay was read by C. R. E. Koch, of Chicago, on "Abrasion and Erosion."†

It drew forth the following discussion:

Dr. Chase, of St. Louis, said it seemed to him that one idea, and an important one, had been entirely left out of the theory in erosion, namely, *vital action*. True *abrasion* always is mechanical. Where the tooth is worn down below the enamel, there is a smooth, glossy substance, harder than even the enamel itself. This is not caused merely by friction, but the ends of the tubules have become filled with lime salts, just as a portion of the pulp may become solidified.

In regard to erosion, he did not think it owing to chemical action; and that it occurs in places where no mechanical abrasion could have produced it was true. But what has caused it perhaps no one could at present explain. May it not be vital action? He wished to impress the fact that vital action will soften and absorb the dentine from under a perfectly water-tight filling; had observed cases in which, after the tooth had been filled for four years, he had found, upon removal of the filling, that the pulp was largely exposed,—could not suppose that this condition had existed ever since the tooth was filled, four or five years ago. This is vital action. It has been stated that, in order to absorption, the tissues to be absorbed would have to be in contact with the vessels: this is not necessary; the red blood-vessels are not essential to it, as absorption took place in cases where they are not within twenty inches. He referred to the umbilicus.

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* Copies of which may be obtained, in pamphlet form for 50 cents, or bound in cloth for 75 cents, by applying to C. R. E. Koch, 645 Wabash Avenue, Chicago.

† Published in the DENTAL COSMOS for August.—ED.

There certainly is a basal structure in the enamel; the columns have a skin which is supplied with plasma of the blood, and he does not doubt that absorption may go through this. It is easily to be seen that not only the lime salts, but also the organic matter, may thus be carried off. He wished to impress the idea that vital action has much to do with caries. What do we see in the milk teeth? This same vital action has carried off a large proportion of the dentine, and sometimes in lifting off the caps of enamel remaining we find that even this has been acted upon to some extent in this manner, it being much thinner than it would be in the natural condition.

Dr. Koch stated that, in his paper, he denied an analogous process to absorption of the deciduous teeth, in the removal of tooth substance by erosion, simply because, in the absorption of the deciduous teeth, there is always in contact with the tissues to be absorbed a highly vascular plexus, which was entirely wanting in erosion.

Dr. Black, of Jacksonville, Ill., wished to say, in reference to absorption of the walls of the pulp chamber, that it is owing to inflammation, swelling of the pulp, and consequent pressure, but he could not see where any such influences could act upon the outer portion of the enamel; does not think absorption could occur, unless the absorbent spoken of was lying in contact with the enamel. The appearance of erosion is not like the result of acid action, and if brought about by an acid it must be in a manner different from the observed action of acids. He had a case of erosion upon the proximal surfaces of all the upper teeth, anterior to the bicuspids; the patient had never used a toothpick, and cleaned his mouth but seldom, yet his mouth was in a clean and healthy condition; and unless this be caries, there was none.

Dr. E. C. Chase, of Iowa City, read an essay on "The Chemistry of the Oral Secretions; their Action on the Teeth," which was very attentively listened to, but not discussed. The following is one of the arguments contained in it, upon the necessity of preserving the alkalinity of the saliva:

The neutrality or acidity might be brought about by the carbonic acid which passes off from the system in large quantities by each exhalation of air from the lungs. This, coming in contact with every portion of the saliva as soon as it is emptied into the mouth, would tend to transform it immediately to an acid fluid; and particularly would this be the case in the mouth of one who exhaled through this cavity instead of the nostrils.

The saliva now being changed chemically, the conditions favorable to the solution of the phosphate of lime of course are not present, and this substance is precipitated as an insoluble powder. It now finds its way between the margins of the gums and necks of the teeth, and is slowly but constantly deposited, first in the interstices in the enamel, and there gets a firm hold; and then layer upon layer is piled on, until in time, if nothing interferes, there is formed a huge mass which becomes the seat of disease and corruption, and even of animal life. Now, from whence is the carbonate of lime? We have already seen that the mixed saliva is slightly impregnated with carbonic acid coming from the lungs. This then might act upon the lactates of lime, soda, and potassa, forming carbonates of them all, and we would have carbonate of lime, carbonate of soda, and carbonate of potassa. Now it is a well-known chemical law or fact that carbonates of the alkali metals, such as potassium, sodium, ammonium, are soluble, while the carbonates of the alkaline earths, such as calcium, strontium, and barium, are insoluble. The carbonate of lime, belonging to this latter class and therefore insoluble, would be precipitated as a white powder, and, like the phosphate of lime, would lodge in all protected places on the teeth, and with it make up the bulk of tartar as found in the human mouth. During sleep the conditions are most favorable for its rapid formation: it is then that the parts are in almost perfect rest; hence it remains where deposited; now it is that respiration proceeds through the mouth, and the supply of carbonic acid is abundant.

From the foregoing will be seen the importance of preserving the normal alkalinity of the saliva, for upon this property depends its power of retaining in solution the principal ingredient of tartar or salivary calculus.

Dr. G. O. Howard, of Galena, Illinois, then read an essay on "The Removal of Dental Pulps; Preparation and Filling of Pulp Canals."

The essayist recommends great care in the removal of dead pulps, that nothing be left behind; after which a small piece of cotton is passed into the canal for the purpose of preventing chips from getting into the canal and being forced through the foramen; then the canal is enlarged. This he thinks the most difficult task, and deprecates hurrying through this operation. After opening canals he removes the cotton, and applies carbolic acid, or creasote and iodine, by pumping up thoroughly; lets this remain about a week, and if after that time there is no soreness present, fills; recommended a chloroform solution of gutta-percha as the best material for filling roots (he described particularly his manner of manipulating); fills pulp chamber with Guillois's cement, and the rest with gold. In cases of alveolar abscess with fistulous opening, fills as mentioned, without any preparatory treatment, and feels certain that nature will effect the cure; believed that in nine cases out of every ten of alveolar abscess nature would effect a cure if the roots were filled perfectly, so there would be no lodgment for pus, etc.

Dr. Glidden, of St. Paul, stated that he had used the gutta-percha solution in this manner for a long time; allows instrument to remain until chloroform has evaporated, having carried it to the very apex; fills at first sitting in most cases of abscess, having previously thoroughly cleaned with creasote.

Dr. Black, Jacksonville, Illinois. How would you proceed after removing the *dêbris* from the pulp canals of a molar? If pus be discharged through the apices it will usually within twenty-four hours re-collect. He wished to know if such cases would be filled at once?

Dr. Glidden. Yes, sir. I would first wipe it with creasote. Sometimes the pain is acute.

Dr. Black has no doubt many cases of abscess may get well of themselves, but would not like to subject patients to the excruciating pain; does not think there is any difference whether gutta-percha or gold be used. Forcing the pus to form an external opening did not strike him favorably.

Dr. Glidden. How long would you treat such a case?

Dr. Black. In any ordinary case, should expect to succeed within a week. Frequently in cases where alveolar abscess is forming, a lump arises upon the gum, but owing to insufficient force to bring it out, it remains stationary sometimes for two or three years, always sore. As to time for filling roots after removal of pulp, differs from paper. He immediately fills cavities without further cutting, after giving a few minutes for bleeding and saturating with carbolic acid. If pus or blood remain in pulp canals for twenty-four or forty-eight hours, there is more danger of discoloration of tooth than with such treatment. This, his experience teaches him, is the best practice for the health of the tooth.

Dr. O. Wilson, Aurora, Illinois. Supposing other parts healthy, forcing creasote up the canals would be injudicious, as, unless abscess has actually formed, active medicines or escharotics should not be forced upon the pericementum. Whichever way the canals are filled, it must be water-tight. Where we have abscess hemmed in by a sac, protecting other parts, or with a fistulous opening, this must be broken up with active remedies. When we have a discharge we must infer that we have an active sac, and generally pus does exude from pulpless teeth. In a recent case, could discover no exudation of pus. Patient insisted on filling at once, as there never had been any trouble with the tooth. The very first night after the operation the tooth began to ache terribly. Had the pus been allowed to come down, this would have been avoided.

If we can cure chronic and acute abscesses by simply filling the roots with any substance, the millennium for us has nearly arrived, and we ought to rejoice. If he could control even periostitis, he would feel himself greatly favored; still he did not want to discourage the gentlemen who are so sanguine; but if the truth of their statements can be demonstrated, it would lift a great burden from dental practice, and he would be ever obliged to the man who discovered the proper method.

Dr. Dean, of Chicago, thinks there can be no doubt where a fistulous opening exists, that after creasote, or its equivalent, has been forced through it, the root may be filled at the first sitting, and the abscess, in most cases, effectually cured. But where there is no such opening, even the filling of the canal with cotton dipped in creasote, and sealing with sandarac, will often produce intolerable pain.

The gentleman from St. Paul does not claim to *cure* abscess by his mode of treatment, but to produce a fistula by closing the root canals, and then let the abscess take care of itself. He would advise the younger members of the profession not to adopt this mode too rashly, as he would be fearful of the results; it was, at least, unsafe practice. On the subject of root-filling, the speaker would not object particularly to the material advocated (Hill's stopping) for this purpose, but seriously condemns the practice of filling without previous treatment; claimed that the apex could be as easily reached with No. 20 gold foil wound smoothly around a fine root-plugger as with any other material. When the apex of the root has been considerably absorbed, and the foramen enlarged, a small slug of lead, a trifle larger than the canal, introduced and forced down to the end of the root, will adapt itself to the walls, and make a good commencement for a filling; the tolerance by the soft tissues of this metal being well known.

Dr. Glidden said it was possible that he may have had failures with this method, but they have not come under his observation. Gutta-percha is easier introduced than gold; the latter is apt to lodge in crooked roots before it reaches the apex, but the solution of gutta-percha is before the instrument in a semi-fluid state, and must fill up any space. He has filled with good success with goid, but with better by this method; does not force the creasote through the apex, but simply wipes out without pressure.

His nerve-drills have four cutting grooves fashioned similar to Gates's, and have guide-points of various lengths and sizes. In a crooked root these instruments are particularly useful. His practice may be dangerous, as the gentleman from Chicago had observed; he was ready to be convinced of this, although he had been successful.

Dr. Howard, of Galena, Illinois. This practice strikes every one upon first sight just as it did him, but with it he has certainly had better success than ever before; hopes the young men would not accept Dr. Dean's advice.

Dr. Goble, of Dubuque, Iowa, has treated five cases in this manner, and after six months they are all a success.

Dr. Ingersoll, Keokuk, Iowa. We must regard abscess as a new and an abnormal organization as truly as fungus, polypus, and tumors; and in order to cure, must thoroughly destroy them by means of escharotics, which, in order to be effectual, must reach every vestige of the sac. He transforms the root into the barrel of a syringe with a smooth opening, fills the enlarged canals with creasote, fits a piece of caoutchouc to serve as a piston, puts a blunt point on this, and forces the fluid through the apex by pressure upon the piston. If he fears that the escharotic has not come in contact with all parts of the sac, repeats until satisfied that it has; then proceeds in due time to fill.

Dr. Richey, of Elmwood, Illinois. Where abscess has no fistulous opening, does the gentleman know that his caustic has come in contact with every particle of the sac?

Dr. Ingersoll. In such cases a fistulous opening is compelled by compact filling with cotton, saturated with sandarac varnish, or with some other temporary filling.

Dr. DeCrow, of Quincy, Illinois, uses soft red rubber for piston, first placing rubber dam on tooth before using creasote. If one application is not sufficient, repeats in a week; has been generally successful; in one case, left superior incisor,—a chronic case,—made several applications without any beneficial result. The apicial opening was large,—no trouble about passing a large broach through it. At one of these injections no fluid came through the external opening, and it was discovered that back of the dam the creasote was running out through a palatal opening; kept up the treatment, but without success,—without any farther discharge, however, through the palatal opening; finally filled with os-artificiel, but the tooth to-day is just where it was a year and a half ago.

Dr. Kulp, of Davenport, Iowa, has for several years, especially in front teeth with fistulous openings, filled at once, after being satisfied that the escharotic had reached the entire abscess; does not do so in bicuspids or molars. The greater difficulty exists where there is no fistulous opening. He believes the most effectual treatment to be the forcing up creasote and iodine and closing in tightly, as this will in a short time produce an opening.

Dr. Shattuck, of Belle Plain, Iowa, believes the only cure for the case stated by Dr. DeCrow to be extraction, as probably the processes as well as the apex of root are necrosed.

Dr. Smith, of Burlington, Iowa, thinks that in this case a large portion of the soft and hard tissues have been absorbed by the corrosive action of the pus, and to feed it. When enlarged apices exist from absorption, we may not succeed in our treatment in reaching every particle of the abscess, and it will then keep on spreading until the last vestige of the diseased tissues is destroyed.

He uses a rubber bulb syringe, and, if the abscess has exit at more than one opening, closes all but one; then injects with powerful pressure upon the bulb, completely flooding the sac. He has succeeded in some cases like the one described. If that tooth had been absorbed at the apex, would extract, smooth off the ragged edges without injury to the pericementum, and would replace the tooth, after having injected such medicines into the socket as the case might indicate.

Dr. Bell, of Chicago, has had good success in the manner of root-filling mentioned by Dr. Dean. He made small cylinders of No. 20 gold around a fine point, dipped these in creasote, and filled roots with them, allowing the gold to project a little beyond the point of the instrument, and partially withdrawing the instrument, then carrying back again, thus gradually forcing more gold in the direction of the apex; does not hesitate to use the creasote in full strength.

Dr. Wilson, of Burlington, Iowa. When the pulp is dead, decomposition soon follows, gases are formed, and an outlet sought. If the nerve canal is closed, a fistulous opening must necessarily be formed. Forces creasote or carbolic acid through, and fills at once. The greatest difficulty is in cases without these openings. He may try the methods advocated, yet his past experience rather prejudices him against it.

Dr. Porter, Dubuque, Iowa. For the past eighteen years has treated abscess by all the various methods. About a year ago had a case that gave him considerable trouble. After having treated and filled the tooth, and removed the filling, there was more trouble than before. The tooth was extracted; a bandage some four or five inches in length was kept in readiness, saturated with the blood from the wound, and tied around the root. The tooth and root was then filled and thrown into tepid water. The end of the root was atrophied; a small portion of apex was cut off. A new flow of blood was then excited, and the tooth replaced in its socket and ligated. The patient was then dismissed for two days. There was no swelling, and the ligatures were removed in six days; and after nearly a year's time it is a success.

Has treated thirteen cases in this manner with entire success. Lost two cases only—a lady sixty-five years of age, and the other a patient suffering from ague; both lost by neglect and sickness, and, residing in the country, they could not receive the attention they required; recommends this as the great desideratum where all other methods fail.

Dr. Crouse. In cases of teeth with dead pulps of long standing, thinks it much better to treat too often rather than not often enough. Uses creasote a number of times, getting to the end of each root if possible, so that every particle of decomposing matter, and the gases arising therefrom, are destroyed. Dr. Glidden's drills are superior to any we have in the depots, which may account, in part, for his success in filling dead and abscessed teeth without previous treatment. As before said, we must have all decomposition stopped and the root in a healthy condition, before filling, and in case of alveolar abscess the sac and growth at the end of root must be destroyed. His plan of getting creasote through the fistulæ is with india-rubber; makes a piston of it by cutting it something of the shape of the carious cavity; then fills the root with creasote and pumps with the rubber piston, making quick and rapid motions, using some blunt instrument that will not pierce the rubber. Often succeeds in getting the creasote through without enlarging the pulp canal, but when we cannot succeed without drilling and enlarging the canal, this should be done. He makes a drill for these special cases, filing it very small, so that it is limber a considerable way; then makes a good spring temper, and it works admirably. He much prefers, however, not to drill through and enlarge the opening at apex, and never does it unless he cannot succeed in forcing the creasote through the fistula. He would then close the tooth with temporary filling, if it was likely to be stubborn about getting well, before filling permanently.

The dissolved Hill's stopping is very good to fill certain cases, as where the root is crooked and when it is impossible to fill with gold with any certainty; but in most cases fills with gold after plan suggested by Dr. M. S. Dean, with No. 20 or 30 foil; he thinks in this way roots can be filled, in a majority of cases, better than with any other substance. Next to this, perhaps, comes gutta-percha, or Hill's stopping dissolved in chloroform. It has the advantage of not requiring so much skill or care in its manipulation. The treatment of the case spoken of by Dr. DeCrow could not be very definitely determined here without an extensive description. We must have all the circumstantial as well as direct evidence. The former habits of the patient should be known. Some constitutional difficulty, perhaps syphilis, is at the bottom of the trouble. If every other known remedy has failed, and there is no prospect of nature setting up a healthy action, then it may be allowable to extract and replant the tooth. The practice of extracting and replacing teeth should be the very last resort, and only practiced as such; had but little faith in it himself. To make it a general practice is not rational, and does not belong to the nineteenth century.

Dr. Waid, of Newton, Iowa, extracted and replanted a tooth that gave a great deal of trouble three months after filling. It was an entire success after the ninth day.

Dr. Porter. The gentleman from Chicago misunderstood him; resorts to this practice only in extreme cases; in all cases uses the fluid extract of buchu after the operation, to prevent soreness and inflammation. The socket should not be washed out with anything, but the clotted blood removed, and by that means a new flow of blood excited an instant before the tooth is reinserted.

Dr. Chase, St. Louis. These cases of replantation are very interesting, and they are more numerous than we should have supposed. Some twenty years ago a case of this kind was first reported in the *Dental News Letter.* We know that teeth have been knocked out and lain in the dirt for two or three days, and after replacement have grown firm, and after recent luxation the circulation has become re-established. In case of persistent alveolar abscess, he thought every one justified in conquering it by extraction and replantation.

The idea that the periosteum is destroyed by cutting off the apex of the root, is all a mistake. It is not at all necessary to keep the tooth in tepid water or blood. Time may be taken for the operation. In some cases it may be well, previous to operating, to take an impression for making a plastic retaining cap or splint upon, to be used after replacement of the tooth. He should treat the next case of a persistent nature that came under his care in this manner.

When there is no external opening in alveolar abscesses, he forces creasote up; it causes great pain. He remembered a case of two teeth treated in the same mouth, though not at the same time. One had an external opening, the other not. In the case without opening there was more pain than in the other, but it succeeded in a shorter time than the one that had the opening.

In a communication in a recent number of the *London Dental Review,* the author advocates pepsine for dissolving dead portions of pulp. This struck the speaker favorably, and accordingly he had tried it for several months. It accomplished its work within a few hours, provided the pulp has not previously been treated with creasote or tannin.

Dr. Ingersoll. If the abscess is filled with pus, it requires more of the escharotic, as the pus will neutralize a portion. He treats other than the single-rooted teeth in the same manner. His method is peculiarly adapted to molar teeth; introduces the creasote upon a loosely-wound pledget of cotton, then with the rubber ball pumps it through the roots, and repeats until satisfied that all the abscess has become bathed with the fluid.

Dr. Kilbourne, of Aurora, Illinois, related a case of extraction of a first bicuspid for incipient ulceration, and replantation; the tooth was replaced and left without ligations, and has been doing well since,—about two years ago.

Dr. M. S. Dean, of Chicago, then read an essay on "May the Calcific Elements of the Deciduous Teeth be appropriated in the Formation of any portion of the Permanent Ones?"

The paper was a very able and conclusive argument in the affirmative, but it would be impossible to give a synopsis that would be at all adequate.

It elicited the following discussion:

Dr. Black, Jacksonville, Illinois, wished to call attention to one point, —that is, non-absorption of the roots of deciduous teeth with dead pulps. It is often very difficult to determine how far absorption had progressed before the pulp died, but he believes that absorption is not prevented by loss of vitality, but by diseased conditions of the membranes investing the root. If these membranes remained healthy, absorption would progress; could not see that such matter removed from dead teeth would take any other channel.

Dr. Judd, St. Louis. Every one who has listened to the reading of this paper is doubtless convinced that the argumentation is sufficient to establish the doctrine that certain portions of broken-down tissues are reappropriated for nutritious purposes by the system. Were it necessary we might, however, adduce in favor of this proposition one or two other reasons which point in the same direction. The lymph, which is doubtless a product of tissue disintegration, passes from the capillary lymphatics into the thoracic ducts, and thence into the subclavian veins and on to the right side of the heart, from which it is sent with the venous blood to the lungs, to be oxygenated and prepared for performing its nutritious functions. Now, if it were useless, and intended only to be excreted, would it not have been poured into the arterial system and carried directly to the excretory organs, which would eliminate it from the system?

Dr. Chase, St. Louis. If nature is so economical in the use of her materials, why don't she use them in starvation? A certain loss of all tissues goes on when food is not taken into the system, so that if new food is not given death is the result. Why don't she keep the person alive? An ounce of the salts of lime and soda is daily thrown out by the urine alone. Why don't she keep it in the system? He doubts not the elements of the deciduous teeth, the living lime salts, may be reappropriated, but is it *necessary* for them to be so reappropriated? We find plenty of the lime salts in the food, and especially in the cereals.

Dr. Sanborn, Tabor, Iowa. We eat and drink for the purpose of replacing broken-down tissue. When tissues have subserved the purpose for which they were assimilated, they are disintegrated, and are no longer capable of reassimilation.

Disintegrated tissues are reabsorbed, and are removed from the blood through the emunctories,—the lower bowels, kidneys, liver, lungs, and skin. Dead matter, as a dead tooth or a necrosed bone, is removed by a process we call ulceration.

There is a difference in the process of tearing down deciduous teeth. The roots of healthy deciduous teeth are not disintegrated to be removed as broken-down tissue, but are absorbed and again used; but if they are dead they are treated as dead matter, which is poisonous to the system, and instead of being absorbed and removed, as ordinary disintegrated tissue, they are refused a passage through the system, and are removed from it directly by ulceration. In starvation, disintegration goes on, but assimilation does not take place. The vital powers can use only substances of organic matter to build up tissue; when the tissues are worn out, their matter bears the same relationship to vitality as dead or inorganic matter.

Dr. I. P. Wilson, of Burlington, Iowa, then read an essay on "Anatomy and Histology of the Teeth, and the Influence of Certain Agents upon the Dental Tissues."

After giving a general anatomical and histological description of the components of the teeth, he said:

The dental tubuli, which form a complete network throughout the entire dentine, should not be exposed to arsenic, when applied to destroy the pulp; and to avoid this, extraneous matter should not be removed from the walls of a decayed tooth until after the arsenic has been employed and the pulp destroyed; otherwise the dentine will become thoroughly impregnated with the poison, and unpleasant results may follow.

After the pulp is removed, the nerve vessels sometimes bleed quite freely; and if the walls of the cavity, with its exposed tubuli, are bathed in blood, and confined there by a temporary filling for a few days, the tooth will become much more discolored. A sandarac plug not only makes a temporarily water-proof filling, but it forms a coating over the walls of the cavity, thereby closing up, to some extent, the ends of the tubuli when, at a future time, these tubes are effectually closed by deposits of the lime salts.

Instruments are sometimes broken off in the roots of teeth, and if deoxidizing agents are used in after-treatment, the steel is decomposed and taken up into the tubuli, and circulated throughout the dentine, thus giving the tooth a dark ink-like appearance.

It is claimed by some that amalgam may be driven with such force into a cavity as to cause the minute globules of mercury to insinuate themselves into the freshly-exposed tubuli, thus creating inflammation of the dentine, and ultimately destroying the vitality of the tooth. The pernicious influences of the agents above named upon the dental tissues must be apparent to all, and without enlarging upon the points hinted at, we will conclude by calling attention to the importance of furnishing suitable nourishment, as repairing material to build up the broken-down tissues of these organs. We are too apt to lose sight of the fact that the elements entering into the formation of the entire system are changing, ever changing; that good dental organs to-day does not necessarily imply good teeth for the next year.

Dr. C. Stoddard Smith, of Springfield, Illinois, does not believe that arsenic effects any change in the tooth tissue; there is no difference in the result, whether the pulp is devitalized by arsenic or by the ordinary process of inflammation.

Dr. Swain, of Chicago. How does arsenic produce death of the pulp?

Dr. Smith. It does it by its power of inducing an inflammation of the part to which it is applied. It is an escharotic in some degree, and in this case its action is merely local; the *constitutional* effect of arsenic applied either to an excoriated surface or directly to the stomach is found to be to produce an inflammation of the coats of the stomach; but no arsenic enters the circulation even of the pulp so long as the application is kept inside the tooth. Arsenic is a preserver of tissues; and some experiments were made by Professor Flagg, of Philadelphia, which proved that an ordinary arsenical application would perfectly preserve a large frog, converting it into a perfect mummy. We know well enough that pulps of teeth treated with arsenic are not mummified, but, on the contrary, putrify and produce abscess. Dr. Flagg also tested about one hundred pulps, which were removed entire, and in the majority of cases not even a trace of arsenic was found, and in those in which a slight trace was found it was only an amount which probably adhered to the outside of the pulp. For these reasons it is believed that no arsenic enters the circulation of the pulp, much less of the surrounding tissues.

Dr. Judd, St. Louis. He has been led to believe that exceedingly small quanities of arsenic are absorbed, because when only a very small point of the horn of the pulp is exposed, and arsenic employed, the tooth extracted in a few hours afterwards and broken open, we find the entire pulp congested. A hot iron would not produce congestion to this extent. Irritants or caustics will produce sloughing, and the tissues will afterwards heal up, and hence he believes a small quantity of arsenic must be absorbed and carried into the circulation of the pulp.

Prof. Peck, of the Medical Faculty of the Iowa University, was invited to the floor. He said: Dentistry is a part of surgery which he respects, but of which he is entirely ignorant. He came to listen, and not to speak.

A great change has taken place in medical practice. It used to be supposed that the pus, in cases of abscess and in other suppurations, was in the system, and must be gotten rid of, but we have learned through the investigations of Von Recklinghausen and Cohnheim that the pus-corpuscle is only a white blood-corpuscle, and that it comes from the blood; so our ideas in relation to the necessity of its expulsion from the system have changed, and we now find that it is better in some cases to endeavor to produce absorption of pus, even after an abscess has formed, etc.

Dr. Judd. That arsenic taken into the stomach is absorbed was observed by Orfila many years ago. If this is true, what reason have we to suppose that it cannot be taken up by the veins of the dental pulp?

As Professor Peck has stated, the opinions and practices of the profession have greatly changed in consequence of the investigations of Von Recklinghausen, Cohnheim, Stricker, and others; and although there be no necessity of expelling pus from the system, in the sense in which it was formerly argued and practiced, still it is probably best in many cases to evacuate the contents of an abscess, rather than to depend upon its absorption. He had a case of abscess at the apex of root, in which he made every effort to break it up; finally stopped up the canal of the tooth while the pus formation was going on; supposed after a little time there would be a fistulous opening. This did not occur, but the absorption of the pus was complete. We must bear in mind, however, that although pus-corpuscle and white blood-corpuscles may be said to be identical, still it would perhaps be better to say that the pus-corpuscle was a descendant of the white corpuscle of the blood, though perhaps we shall be unable to determine satisfactorily where the line of distinction between the two should be drawn. Paget, arbitrarily, as it is thought by some, fixes the distinguishing characteristic in the commencement of a fatty degeneration of the white blood-corpuscle, after which he considers it a pus-corpuscle. That there must be a difference is evident from the fact that the white blood-corpuscle is capable of being wrought out into the elements of tissues, but we have no evidence to show that the pus-corpuscle is capable of being organized into any kind of tissue, though it is probable that they are capable of self-multiplication. These theories of Paget's do not seem to be indorsed by Billroth or Rindfleisch, who are undoubtedly first-class authority upon this and kindred subjects. Pus may be absorbed in two ways, one where the pus-corpuscles are broken down and dissolved by a fatty degeneration; and it is now also well established that the wandering cells or white blood-corpuscles, which have escaped from the blood-vessels into the connective tissues, may return again to the vessels through the medium of the lymphatics, the capillaries of which have been shown to have direct communication with the lymph tracts which are found among the connecting tissue fibers.

Dr. Kulp, of Davenport, thought arsenic applied to pulps of teeth was absorbed sometimes. In cases of large exposure, after the application of arsenic, he has had patients complain of peculiar symptoms of general sickness, a feeling of lassitude, etc., similar to the symptoms produced by constitutional administration.

Prof. Peck wished to ask Prof. Judd if, in dental practice, the aspiration had been used in cases of abscess, and if special attention had been paid to the influence exerted in pathological conditions by parasites.

Dr. Judd. The abscesses connected with the fangs of teeth, which include a large majority of all that the dentist is called upon to treat, are generally small, and are usually easily cured by evacuating the pus and disinfecting by means of creasote or carbolic acid. The aspirator has not to my knowledge been resorted to for drawing off the purulent matter, but the use of carbolic acid was extensively used for disinfecting abscesses, long before Lister promulgated his theory of the treatment of wounds with this agent, though we must perhaps admit that for the most part the practice was empirical, though the philosophy of the treatment now seems to be pretty well understood. He would remark, however, that occasionally abscesses which are usually taken for alveolar abscesses are met with, which are obstinate and exceedingly difficult to cure. He thought these cases differed from the common alveolar abscesses in this: that in the latter there was a complete sac surrounding the apex of the fang, and extending to the external fistulous opening, and that the pus was confined to the cavity of this enclosing sac; but in the obstinate variety the sac had at some point been broken down, and the pus came in direct contact with the surrounding tissues, and usually there was caries of the alveolar processes, and sometimes also of the body of the maxillary bones, as a consequence of the purulent infiltration.

Dr. Morrison, St. Louis, believes it true that after the administration of arsenic it is traceable throughout the blood, but the coating of the stomach is principally affected; and in pulps of teeth the outer surface may be most affected, yet it may go beyond the roots. The walls of the veins are broken down, and a general state of congestion prevails.

Dr. K. B. Davis, of Petersburg, Illinois, followed with an essay on "Contour Fillings," in which he strongly advocated the restoration to natural contour in all broken-down molars and bicuspids, in order to preserve their original masticating surface; "in all of the anterior teeth in order to preserve the facial expression and to aid in the articulation of words." The use of screws is advocated in cases where a sufficient anchorage cannot be otherwise obtained.

Dr. DeCrow, of Quincy, Illinois, said in too many cases the operations were not as permanent as they should be, and wished to know why.

Dr. Willson, of Aurora, had hoped some one would demonstrate the use of screws in contour fillings at the clinics; as a general proposition, where much gold lies outside the margins of the cavity, success was the exception. Nothing but very favorable conditions has made it otherwise, at least until the screw was revived. Indeed, so many have been the unfavorable conditions that many practitioners have abandoned general restoration in full.

But the question is a too important one to be at all neglected. Those of you who have the largest observation upon the subject of absorption of the alveoli can but shudder at the thought of losing the natural teeth, and can but hail with delight anything that will avert the necessity of a plate. Dr. Swain will tell us of the pivot tooth.

Dr. Honsinger, of Chicago, objected to demonstration of the screws, because he was not interested in the patent (laughter). There is a question as to the advantages of screws; he believes that in incisors and molars, they are advantageous, but not so in the bicuspids. The thread of the screws ought to be coarser than those sold as Mack's screws, and after having drilled the hole, it ought not to be tapped.

Dr. Kulp, Davenport, Iowa, said it was impossible to make a solid contour filling without the aid of the rubber dam, and in these cases it was particularly essential that the flaps of the rubber should remain fixed, out of the way of the operator, so that he might give his entire time and attention to the operation proper. He then exhibited a new dam-holder, the invention and donation to the profession of Dr. Magill, of Rock Island, Ill., and demonstrated its use.

Dr. Black, of Jacksonville, Illinois, regards screws as of great importance. The obtaining of the patent has been beneficial to the profession, as it has directed general attention to the matter, although he, as well as Dr. Honsinger, had used screws for that purpose long before the patent was ever issued.

To test the retaining power of these screws, he screwed one into the dentine of an extracted tooth, and built gold around it. It took quite a severe blow to detach the gold from the tooth, much more so than with ordinary retaining pits.

He built up a lateral incisor, worn down by abrasion to the gums, without excavating at all; simply put in four screws and built to them on square surface; after seven months of rough usage, it remains a success. In the insertion of these screws, care is necessary; the tap is too large for the screws—though cut by the same plate—as gold, being softer, will cut smaller, and still expands while tempering. The thread of the screws should be larger.

Dr. Kitchen, of Galva, Illinois, hoped that something would be said in regard to forming contour fillings in bicuspids, with a view of keeping them permanently separated.

Dr. Dyer, Chicago. When Dr. Black relies upon screws alone for retention of his fillings, these being denser than the filling, would not their greater expansion lift the filling from the dentine?

Dr. Black. Theoretically, yes; but it is not shown in practical working.

Dr. Chase, St. Louis. Mack's screw taps are useless. He drills holes corresponding in size to screws minus their thread, and screws into the dentine; this makes firm work. The kind of gold used makes not much difference; has used Kearsing's prepared blocks, No. 60; Williams' cylinders, as high as No. 2, may be used in large fillings; uses Kearsing's and Pack's blocks almost entirely.

If care is taken in condensing the gold and preparation of cavities, does not think failures need occur; does not know of but one failure in his own practice within the last five or six years; mallets in the direction of the apex of the root in all contour fillings.

Dr. Crouse, of Chicago, is as much in favor of contour fillings as any one, when it does not interfere with free separations, so that all particles of food can be removed. One of the chief objections to restoring the broken crowns to their original shape is that it brings them together so that food lodges between them, and from the difficulty of removal, it is left there, and will destroy the best of operations many times. To restore crowns to their original shape endangers the part most likely to fail, viz., the cervical margins.

Besides, the difficulty of dressing the gold down perfectly, so that none overlaps at the cervical margins, is another objection to having them so contour; for if the gold is allowed to overlap, the best condensed fillings will sometimes be destroyed from this cause. Hence, his plan, when the objection spoken of exists, is to make separations sufficient to insure cleanliness.

Another cause of failure is a want of thoroughness, first in the preparation, securing good anchorage, and cutting away the parts which are likely to break down; then, in filling, every step must be thoroughly taken. One must have system as well as thoroughness throughout the entire operation. Many times the mind and body are taxed to their utmost, and the operation is left incomplete. If all is done properly, crowns can be restored, to be of great benefit, and, as was urged by the essayist, more should be done in this direction.

Dr. Kilbourne, of Aurora, Illinois. Discrimination is necessary as to how and when to make contour fillings, and proper care on the part of the patient is essential to keep them in order. Teeth should be so shaped as to be self-cleansing, but he thought cutting away half of a tooth was preferable in some cases to allowing the teeth to crowd together, so that they cannot be cleansed.

Dr. Kulp, of Davenport, if walls of bicuspids are broken down, cuts away freely to solid, safe substance; separates by means of cotton wedges; restores the grinding surfaces so as to allow ample space for finishing, and for cleaning afterwards; this he considers especially important in bicuspids and molars.

Dr. Davis, of Petersburg, Illinois. This subject is a very important one to us as well as to our patients. We read much about the injury from plates, and if we would do more contour filling, much of this would be avoided. We should always recommend that which is best for our patients, and it certainly is our duty to restore as much as possible of every tooth. In doing this, every step of the operation should be done with the utmost thoroughness. Instruction to the patient as to proper care of the teeth after filling is essential for its success.

Dr. H. S. Chase, of St. Louis, read a paper on "The Part which Vital Action Plays in the History of Dental Caries," in which he claimed that the process which produces that disintegration of the dental tissues which is usually called dental caries is neither wholly chemical nor wholly vital, nor did he think there was sufficient evidence that fungi assist materially in its development and progress. He contended that the destruction of tooth-substance is mainly produced by chemical decomposition, but that vital actions play an important part in the progress of dental disintegration,—that it is a living movement which builds up the tooth-structure, and the same process in a different direction which takes down particle by particle the edifice which had been so beautifully erected. He contended that irritation of a tissue may produce, under apparently the same circumstances, either of two opposite vital movements, namely, a loss of substance or an increase of substance,—exostosis being caused by the irritation of a decomposing pulp; at other times absorption of the cementum and dentine of the roots taking place from the same cause. He considered it probable that in many cases of chemical disintegration of the teeth the irritation produced in the dental tissues causes a vital movement, resulting in rapid decalcification of the dentine, and, perhaps, also absorption of the basal or animal substance of that tissue, instead of the opposite process of extra deposition of lime salts in the dentine as a barrier to the decaying process. The leptothrix he considered could not initiate dental caries, but might, as a concomitant of the disease, accelerate its progress.

[Want of space prevents our continuing the report of this interesting meeting. Dr. Chase's paper was ably discussed, and the other papers read were instructive, as were the discussions which followed; but we cannot do more than name them:

"Pivot Teeth," by E. D. Swain, Chicago.

"Diseased Conditions,—their Effects upon the Teeth," by G. V. Black, Jacksonville, Illinois.

"Care of Children's Teeth between the Ages of Six and Fifteen," by P. E. White, Davenport, Iowa.

"Mechanical Dentistry," by Wm. O. Kulp, Davenport, Iowa.

"The Elevation of the Dental Profession," by C. Stoddard Smith, Springfield, Illinois.

"Prevention and Treatment of Decay on Proximate Surfaces of the Teeth," by G. H. Cushing, Chicago.

"Unusual Cases in Practice," by A. J. Waid, Newton, Iowa.

—EDITOR.]

OREGON STATE DENTAL SOCIETY.

THE second session of the Oregon State Dental Society convened at Salem, June 25th, 1873, and was called to order by Dr. L. S. Skiff, Vice-President.

Dr. Fiske was introduced to the society, and, in accordance with previous invitation, addressed the society on "The Effect of Disease upon the Development and Health of the Teeth."

Dr. Gray, of Albany, presented a paper on "Dental Therapeutics."

Dr. Cardwell presented a paper on "The Degeneracy of the Teeth."

Dr. Glenn read an essay on "Dental Irregularities and their Correction."

Dr. Thompson presented a paper on "Dentistry; its History, Present Status, Claims, and Relations."

Dr. Welch offered a paper on "The Cause and Treatment of Loose Teeth."

Dr. Carpenter, in behalf of the Medical Department of Willamette University, offered the society either one or two chairs in that department.

Dr. Gray moved to consider the proposition of H. Carpenter, M.D., Dean of the Department of Medicine of Willamette University, to create two chairs in dentistry in connection with their faculty.

Drs. H. Smith, S. H. Roberts, E. R. Fiske, E. O. Smith, W. Kohler, J. W. Meredith, and G. A. Miller, were elected members.

Dr. Hatch presented the following:

Resolved, That the Oregon State Dental Society offer their hearty co-operation in the matter of establishing a dental department in connection with the Willamette University, and recommend to the consideration of the trustees of said university the names of Drs. William F. Thompson and George W. Gray as suitable persons to fill those chairs.

Carried.

Theses for next meeting were announced.

Dr. Glenn desired to hear the views of the different members concerning their treatment of sensitive dentine.

Dr. Smith recommended carbolic acid.

Dr. Welch recommended sharp instruments and a steady hand.

Dr. Miller reported that treatment with carbolic acid and nitrate of silver sometimes succeeded, but sometimes failed.

Dr. Skiff recommended dietetic treatment, by requesting his patients to refrain from the use of acids a few days previous to the operation.

Dr. Biddle filled with os-artificiel or Hill's stopping until sensitiveness subsided; removed and filled with gold.

After discussing various topics of interest to the profession, the society adjourned, to meet at Portland, on the last Wednesday in March, 1874. J. R. CARDWELL, *Recording Secretary.*

MICROSCOPICAL EXHIBITION OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

At a meeting of this society, held Wednesday evening, September 3d, a committee was appointed to consider the propriety of giving a *microscopical exhibition* under the auspices of the society, to be confined mainly to the comparative anatomy of the teeth. Having been promised by a number of gentlemen interested in microscopical research to aid in this, by the loan of their microscopes, the committee decided to give the exhibition in the rooms of the Philadelphia Dental College, Wednesday evening, October 15th, 1873. The members of the dental profession are cordially invited to be present.

J. H. McQUILLEN, *Corresponding Secretary.*

EDITORIAL.

WHAT IS ORAL SURGERY?

A medical cotemporary is desirous of learning the meaning of what it terms "the new specialty of oral surgery." It is but a few years since a similar query would have been more pertinent in reference to specialties of medicine which have since gained unquestioned recognition, not only with the public but with the profession. Indeed, no class so thoroughly understands and appreciates the advantages of special training—of devotion to a particular branch of practice—as physicians. None so well understand as they the wonderful advances in every department of medicine, nor the vast range of its literature. Surely none are so keenly alive to the impossibility of acquiring even a reasonable proficiency in every line of practice. Hence comes the specialist, and hence also the indorsement of specialties—by none more thoroughly than by the educated physician. The inquiry, therefore, coming from a prominent medical journal, may well cause surprise, unless it is to find excuse in that conservatism which belongs to age, in journals not less than in men.

We will, however, endeavor to enlighten our cotemporary as to the meaning of the term "oral surgeon."

An oral surgeon is one who, having received a general medical and surgical education, is drawn by interest or inclination to the special study and treatment of all abnormal conditions of the mouth, as are others to certain lines of practice now long enough established to have recognition as specialties. Just where such special practice shall begin, what it shall include, and where it will find its limitations, will depend, as in the practice of every other specialty, on the inclination and capabilities of the practitioner.

If, as suggested by the London *Lancet*, it finds its boundary in "stopping and extracting teeth,"—limited to a routine of mere mechanical manipulation,—the attempt to appropriate on such a basis of work or merit the honors of a learned profession is simply to court ridicule; while, on the other hand, to attempt to be an oral surgeon without the foundation of a medical education is neither more nor less than quackery. The *Lancet*, familiar apparently with only that class of dentists who are known among us as "tooth carpenters," is astonished when a dentist aspires to do anything higher than "to stop and to extract teeth." Query. Is London dentistry not yet beyond the days of Pare? But, though unknown to the *Lancet*, there are in England, as well as in this country, those in the dental profession not unknown to fame,—men who have earned, by study and practice, the title of oral surgeon; whose experience and proficiency in the treatment—medical, surgical, artistic, and mechanical—of all lesions of the oral cavity entitle them to a name indicative of special knowledge and skill equally with those to whom are freely accorded the titles of aural or ophthalmic surgeons.

To deny recognition of the force which is developed by concentration is simply absurd. It then only remains to inquire if the lesions of the mouth are sufficiently serious and of such special character as to justify devotion to their study and treatment as a special branch of medical practice. No surgeon, we think, will deny that they are among the most serious and fatal of the lesions of the body, and that their treatment demands a degree of knowledge and skill which renders this department the most difficult in the range of a general surgical practice. A vast amount of suffering and disfigurement, and deaths not a few, are fairly chargeable to the malpractice, or want of practice, of those who, however learned or skilful in other directions, are incompetent to treat dental and associative lesions, because of having made no special study of the subject.

That the majority of those now practicing dentistry are worthy, in any wide sense, of the title of oral surgeons is not claimed. Too many, it may be, are quite satisfied "to stop and to extract teeth;" but in the ranks of the profession are men whose ambition has a wider range, and who are acquiring a legitimate reputation in the medical profession as specialists.

That the profession, now considered by the *Lancet* as devoted to a strictly mechanical pursuit, is to mean, in the near future, vastly more than this, we firmly believe. Let the young men now entering the ranks understand that the dentist is soon to be assigned his true position, either as a mechanic or a specialist in medicine. There cannot much longer be any middle ground. He is to blush when called doctor, or is to feel himself qualified to perform a doctor's duties.

If the student of to-day is willing that his professional sphere shall find its limitations inside the lines which bounded our predecessors, he has not comprehended the meaning of the doctorate which is the object of his ambition. The standard is being steadily elevated, whether the profession is or not, and the man who is under measure must give way.

It must not be inferred that the change prophesied is to be expected this week or next, nor without discouragements and opposition,—such is common history; but that dentistry, or oral surgery, as we prefer to call it, is to be universally recognized as a specialty of medicine, and its capable practitioners as worthy of the highest honors, we are quite confident, notwithstanding the query, "What is meant by this new specialty?"

DENTAL COLLEGES.—THE LECTURE SEASON.

The period has arrived for the commencement of active work in the dental colleges, and we present the following *résumé* of their announcements:

Baltimore College of Dental Surgery.—Thirty-fourth annual session. Lectures will commence on the 15th of October, and continue until March.

Ohio College of Dental Surgery.—Twenty-eighth annual session. Lectures will commence on the 15th of October, and continue until March.

Pennsylvania College of Dental Surgery.—Eighteenth annual session. Laboratory open during September. Preliminary lectures during October. The regular course commences on the first day of November, and continues until March. A clinical lecture delivered every Saturday by one of the professors.

Philadelphia Dental College.—Eleventh annual session. Laboratory open, and preliminary lectures during September, October, and November. The regular course commences November 3d, and continues until March. A clinical lecture or demonstration by one of the faculty or clinical instructors every Saturday afternoon.

New York College of Dentistry.—Eighth annual session. Infirmary open during the entire year. Lectures commence October 15th, and continue until March.

Missouri Dental College.—Eighth annual session. Lectures commence October 13th, and continue until the middle of March.

New Orleans Dental College.—Seventh annual session. Lectures will commence on the 23d of November, and continue four months.

Dental Department of Harvard University.—Sixth annual session. Winter term commences September 25th, and continues nineteen weeks.

Boston Dental College.—Sixth annual session. Infirmary and laboratory open on the first Monday in September. Lectures will commence on the first Monday in November, and continue four months.

Maryland Dental College.—First annual session. Clinical lectures commence October 1st; the regular course commencing November 1st, and continuing until March. Infirmary open during the entire year.

THE

DENTAL COSMOS.

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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S., in the Office of the Librarian of Congress at Washington.]

(Continued from page 453.)

AT the age of eleven, or thereabouts, a more or less sudden degree of development commences,—the children either grow stout or grow tall, or, on the other hand, the continued effort to live seems almost too much. It is now that the teeth begin again to decay. It is now that usually unimportant deviations from normality in the direction of gastric, enteric, hepatic, pulmonary, and cerebral complications are liable to become serious; and it is therefore at this time, that while all other troubles should be carefully guarded against, unusual care should be given to the teeth, that loss of any of these organs shall not occur; that pain from them shall not add its weight tc the already overburdened powers of endurance; that half-masticated food shall not be given to the stomach for too great finishing preparation; but that strength shall rather be added to the economy through dental aid. This period of "caries" is probably the most variable, as regards characteristics and length of duration, of any of the periods during life, for while in some instances it seems to occur most markedly at occasional frequent intervals during the succeeding eight or ten years, in other cases the indications of decay are constantly present; again, while on the one hand an ordinary degree of attention upon the part of practitioner and patient is sufficient to insure a reasonably satisfactory result, we find, not unfrequently, that so decidedly opposite to this is the tendency of some, that the most vigilant watchfulness of the dentist, and the most unremitting attention of the patient, are scarcely sufficient to do more than somewhat check that rapid progress of caries which seems to threaten summary and complete destruction of the teeth. These are the cases which severely try all who are interested,—the sufferers lose confidence, patience, and hope, while the operator finds that care, thoroughness, and skill upon which he has so universally relied, almost as naught in the unequal contest. These are the cases in connection with which it behooves the dentist most fully to appreciate every influence which it is needful to combat, and which demand the clearest explanations of the difficulty; that the patients may be so impressed with the reasonableness of the positions that they may add the earnest, untiring efforts of conviction, to help in this great need. It is in this condition that the necessity exists notably for the addition of sound judgment, unbiased by prejudice, that thus the good of the patient may be most completely insured, and it is just here where the efforts of those who uphold the doctrines of exclusiveness in either theory or practice signally fail. The belief that thorough excavating and most artistic use of nothing but gold foil will insure the desired result, is the weakest of all reeds to lean upon, and will be so proven in a few short months. It is here that the benefit is most decided of that kind of preparation of the cavity of decay which aims at clean outside edges, while permitting literally softened dentine to remain untouched. It is here that the use of tin foil, and especially gutta-percha, as filling materials, is productive of a success which is most gratifying. It is here that nothing must be despaired of, everything worked for, nothing rashly promised or unreasonably expected, everything hoped for,—a clear understanding established between the working parties—and the work done "thoroughly," according to the broadest acceptation of the term, by both *operator and patient.* Under these conditions it is the rule that sufficient is obtained to warrant the assertion that we are tolerably conversant with the systematic treatment of dental caries, and that (as I have said) so far from its being the opprobrium of dentistry, it is the disease in antagonizing which it wins some of its fairest laurels.

Whether this second period of caries is interrupted or continuous, whether it is almost irresistible or only sufficiently powerful to mark a "period," and whether it be of greater or less duration, that systemic change usually occurs between the ages of nineteen and twenty-three, which, considerably and oftentimes almost entirely, stops for a time the further progress of this disease. So decidedly is this the case that patients who, with the most scrupulous care upon their part, have needed much dental aid several times during each of many past years, will now present time after time for examination, and receive most satisfactory reports of present exemption from trouble; indications of commencing deposition of that yellowish-white salivary calculus, of chalky consistency, which seems to pertain so oftentimes to conditions antipodal to caries, will now become observable; and, indeed, cavities of decay, from which fillings have recently been lost, or which had escaped altogether detection and filling, will now remain unchanged in size, and changing only for the better, as year by year the dentine becomes gradually solidified. These seasons are as productive of comfort as the caries periods are of discomfort; they are the times when we can enjoy the fruits of our labors; but when they occur, it should be stated to patients that they are to be taken as among the blessings of life, and the *probable* limit of their duration intimated, in order that all may be prepared for that recurrence which is likely to mark the passage of time. Among male patients the duration of comparative exemption from dental caries continues variably, according to systemic strength and absence of systemic taxation, for ten, twenty, or thirty years,—fifteen years is probably about an average when all temperaments, all degrees of strength, and all varieties of habit are admitted, and thus it is that we find relatively little demand for dental services upon the part of males during the active years of life. It is true that those who from early education, or from early necessity, have become impressed with the value of a complete denture, will make the occasional visits which will result in the maintenance of this condition; the aggregate of all that is required by them is usually so small that *we* wonder that any neglect availing themselves of it; but it must be remembered (and when observed will be noted) that even if a tooth be lost upon every occasion of toothache during average middle life, a fair share of teeth still remains at forty, or even fifty years of age, with which yet to do comfortable mastication. Recognizing this, we should not be surprised when, at length yielding to the repeated suggestions of wives and children, gentlemen visit the office for examination, and little or nothing is found demanding attention; nor should the opportunity be neglected for informing them at how trifling expenditure of time and money they may be found well prepared to meet their probable exigency of future decay at a time when failing powers will demand every aid, instead of their being reduced to the necessity for the employment of extraordinary dental skill for the preservation of the *valuable few* teeth remaining. The exceptions to these average cases are, the continuance, all through life, of more or less frequent manifestations of caries; these are found in individuals of soft tissue, generally of lymphatic tendency; but even these almost invariably give at least some indications of periodicity of decay as their years of life pass by. The seasons of decay present more frequently, and are longer in proportion to the intervals of comparative exemption, than pertain to the average; thus an interval may occur from about twenty-two or twenty-three to twenty-six or twenty-eight; then for two or three years tendency toward decay will be manifested, and frequently will be accompanied with tenderness of dentine. This condition is noticeable in various sulci, upon flattened cusps, and in almost microscopic fissures, which, while seemingly too trifling for any harm, give patients great inconvenience while eating. Singularly concomitant with this, is general inability, not amounting to debility; but again, not infrequently symptoms of increasing systemic trouble become pronounced, until an illness supervenes, typhoid, as a rule, in its semeiology, and procuring, even at this late time, that extraneous aid from rest and medication which has so long been demanded.

This is the state to which I have referred when speaking of the teeth as diagnostics to systemic condition,—these are the sicknesses which may be averted by a little timely attention to those warnings which are almost always brought *first* under the dental eye,—these are the indications which so frequently first show *tangible* evidence of the inability upon the part of vitality to maintain the integrity of the whole organism; lassitude has been felt, a vague sense of fatigue, disquiet, and unrest, has been more and more noticeable,—dental caries, as the result of the first *comparative abandonment* of the outposts, has progressed, perhaps without the least pain, until the crushing of enamel in occlusion has left a sharp edge to annoy the tongue. For the relief of this annoyance our services are requested, and nothing more than this is expected. I have reason to believe that from this basis I have given that early advice which has saved hundreds of my patients from seasons of illness during middle life, and many are they who have assured me that they had trodden before the path they were treading, and that they were thus reminded that it *had* ended in long and weary weeks of suffering. The indications of this condition of things are, of course, most easily noticed in those who have regularly been our patients, for if, after some years of average dental requirements, we should find one or more large cavities of decay in teeth which but a short time before were apparently sound, and if, according to the quality of dental tissue, the progress of caries had left that horny consistency of dentine or white pulpiness which denoted rapidity of disintegration, we would naturally surmise that some extraordinary influence was at work. We might justly conclude that a period of decay had supervened; and if, upon questioning, we were corroborated by the testimony of generally undesirable symptoms, we might as naturally conclude that systemic deviations had reached that point at which interference would be advisable. All this could be learned, even from one who was seen for the first time, and who presented this condition, and it is this which adds much to the value of this sign of general trouble, for now it is that a little change of mode of life, a little extra rest, a change of scene and air of short duration, sometimes a single dose of medicine, happily directed, will give that needed aid which shall enable "vitality" to do its work and re-establish the lost equilibrium.

Among our female patients, on the contrary, we find quite the reverse from this long comparative exemption from caries. I have intimated that, for the most part, the tendency toward this disease seems even more marked in females than in males, everything in surroundings being relatively equal; but as a very large proportion of females contract the marriage tie between the ages of eighteen and thirty, we find, added to the natural influences which we infer to exist alike in both sexes, the complication of pregnancy. This systemic condition is that which is so peculiarly productive of dental troubles that a proverb exists which says, "a tooth for a child," indicating a sort of general acceptance of a fact; but, as in irritation consequent upon undue mental exertion, the greatest troubles seem to be pulp and periodental difficulties, these, from their concomitant of pain, overshadow the seemingly less important inception of cavities of decay in every vulnerable direction. *We* know how easy it is to calm the anguish of an irritated pulp or soothe the throbbing of an inflamed peridentium, without resorting to that extraction which shall perpetuate the "tooth for a child" proverb; but we also know that it is quite another thing, requiring long-continued, unremitting, combined exertion, to stem the downward tide of systemic inability to protect the non-essentials of the parent organism while providing for the perpetuation of the species. This must be thought of, talked of, impressed upon the patient, and insisted upon during pregnancy and lactation; by so doing not only the dentures, but the future health of the mothers, is vastly benefited, and thus they may have preserved to them, for many years, those personal attractions which render youth so charming, instead of being early added to the already fearful number of wrecks of womanhood.

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 509.)

The Region of the Temple and "The Angle of the Lower Jaw."

The region thus named is commonly included in that of the "side of the face." We think this is unfortunate, inasmuch as this term is synonymous with "profile," and the "profile" in its turn is inclusive of the region above named, with one-half of the region of expression. The North American Indians say of a portrait drawn in profile, that it represents but half a man. We may in the same way deprecate the use of the term "side of the face," as representing but half a region.

The region of the temple and the "angle of the jaw" is bounded anteriorly by a line dropped from the external lateral process of the frontal bone to the inferior border of the lower jaw, posteriorly by a line answering to the front edge of the external auditory meatus, superiorly by the temple, and inferiorly by the angle of the lower jaw. Were we called upon to define this region by a physiological test, we would say it is *the region of the distribution of the motor branch of the inferior maxillary nerve.*

The Muscles.—The muscles of the region are four in number,—the temporal, masseter, and the internal and external pterygoid. These are the masticatory muscles, so-called; but properly speaking they are the elevators and rotators of the lower jaw.

The temporal muscle, apart from its origin from the temporal fossa, has an important connection with the temporal aponeurosis. The latter membrane extends from the semicircular line to the zygomatic arch. It is thin and weak at its origin, but increases in thickness as it descends, and divides immediately above the zygoma into two leaflets, one of which is inserted upon the outer, the other upon the inner margin of the bone. Between the layers there is found a small quantity of compact adipose tissue. This, the description given in the books, it is necessary to repeat, to emphasize what follows. The muscular fibres arising from the aponeurosis take their origin from its upper third only. The remaining two-thirds are separated from the muscle by an increasingly wide space, which is continuous with the hollow of the cheek. It is filled with delicate, almost diffluent fat. It will be seen that the temporal fossa when the aponeurosis is in position forms a pocket with its mouth directed downward. The upper third of the pocket is entirely occupied with the muscle, the lower part only partially so. A moment's reflection will teach us the significance of this arrangement. The temporal muscle, while firmly fixed above, is very movable below. Not only from below downwards, as when the jaw is depressed, but from within outwards, as when this bone is elevated and semi-rotated, as in the act of chewing. It is necessary, therefore, that while the aponeurosis is firm below and its upper part fixed, that the loose fat should lie between it and the muscle to lessen friction. This is one of the few instances in the body where adipose tissue is used as a lubricator. Ordinarily this function devolves upon synovia either within sheaths, embracing the tendinous tracts their entire length, or bursæ, distributed at points of the greatest friction.

The tendon of the temporal muscle begins about midway between the zygoma and the semicircular line, and is entirely concealed by the fibres of origin from the aponeurosis. Some of the fibres of the muscle would appear to be inserted into the zygoma, and lie on the same plane with the fibres of origin of the inner division of the masseter.

An additional slip of origin arises from the lower edge of the temporal fossa to effect an insertion distinct from the main tendon, viz., into the *inner side* of the coronoid process. This is best displayed in a dissection of the pterygoids. Thus, after the pterygoids have been removed, and the pterygoid process and the alveolar process of the superior maxilla sawn off, the inner surface of the masseter muscle will be displayed, together with these temporal fibres above named.

We can thus describe, in addition to the main radiating set of fibres inserted into the coronoid process, a set of fibres acting with the masseter, and another smaller set lying parallel to the line of action of the internal pterygoid muscle.

The *masseter muscle* is composed of two layers, an inner and an outer. The outer is tendinous at its origin from the superior maxilla and the malar bone, and muscular at its insertion into the lower jaw. The inner is muscular, tendinous at its origin, and chiefly tendinous at its insertion into the lower jaw. It is covered for the most part by the outer plane. The direction of the fibres of the first set is oblique downward and backward, that of the second nearly vertical. Both sets join at the anterior border of the muscle, so that a pocket is formed between them which opens backward. Monro described a bursa lying within this pouch. When it is remembered that bursæ are found in connection with parts which are subjected to friction, the presence of one in the above locality is suggestive that the two layers of the muscle must have distinct lines of action. The outer layer would appear to initiate the act of elevation of the lower jaw,—the shorter inner fibres to complete the act. The fact that the latter are on the same plane with the aponeurotic fibres of the temporal would indicate that these fibres act together.

The anterior border of the masseter is formed by a doubling of the two layers forming the pocket. It presents a thick columnar edge of fibrous tissue, which is seen to better advantage from the inner than the outer surface of the muscle. This border can be readily felt by the finger inserted between the cheek and the malar bone. Division of the masseter for false achylosis of the temporo-maxillary articulation can be best effected by making a submucous rather than a subcutaneous tenotomy. It will, in all cases, be well to observe the effect produced in simply dividing the tendinous border before resorting to a free incision. Chattering of the teeth is caused by a peculiar state of innervation of this muscle, which differs in this regard from others. In tetanus it is among the first muscles to be affected, and is also instrumental in the mechanism of trismus. Mr. Dixon* has described an instance of sloughing of this muscle in a young man. It followed intense inflammation, excited by a blow received upon the part a fortnight previously.

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* Trans. Path. Soc. Lond., ii., 276.

The *internal pterygoid* muscle is the complement to the outer fibres of the masseter. It is thick, and for the most part tendinous at its origin, and presents at that point on transverse section two imperfectly defined cylinders of fibrous tissue holding a few muscular fibres within them. The fibres are inserted "dispersedly" upon the inner side of the angle and ascending ramus, muscular on its buccal free surface, tendino-muscular on its outer maxillary surface. Sappey compares the outer fibres of the masseter and those of the internal pterygoid to a penniform muscle. It is well to associate this arrangement with the relative positions of the two muscles as an aid to the memory, although it is without any real significance.

The *external pterygoid* muscle is smaller and more delicately composed than the preceding. It is divided both structurally and functionally into two portions. The superior of these arises from the base of the skull, and is remarkable in being the only muscle, save the anterior straight muscle of the neck, that has such connection. It is a little fleshy slip which passes outward and a little backward to be inserted into the capsule and inter-articular cartilage of the temporo-maxillary articulation. The inferior slip is the smaller of the two; it is inserted into the neck of the lower jaw.

The actions of the pterygoids are complicated. The massive internal pterygoid and the masseter act together in directly raising the lower jaw. But before it can do this the condyloid process, which has been tilted out of the glenoid fossa and rests upon the articular eminence, must be replaced. This is done by the external pterygoid; the larger slip operating on the jaw, the lesser one adjusting the capsule and the inter-articular disc. The external pterygoid holds to the temporo-maxillary articulation the same relation held by the popliteal muscle to the knee-joint.

It is worth mentioning in this connection that cancer of the facial region, after involving the bones at the origin of the masticatory muscle, will use the tendon of the muscle as a guide along which the infiltration will take place. A specimen of carcinoma of the superior maxilla is preserved in the Philadelphia Hospital, in which the disease, after involving the malar bone, spread thence along the masseter and the internal pterygoid muscles, to their complete destruction.

The Fascia.—Immediately beneath the skin of the temple is a well-defined, though thin layer of fat, which is continuous with that covering the parotid gland. On the temple this fat is in intimate association with the superficial temporal fascia and its continuation downward into the so-called parotid fascia. The manner of its connection with the tendon of the occipito-frontalis and auricular muscles is familiar to all students of anatomy. With a little care this fascia can be lifted from the parotid gland so as to include within it the superficial lamina of the masseteric fascia, the deep lamina being continuous with the cervical fascia. This arrangement would point to the conclusion that the masseteric fascia is derived from below (deep layer) as well as from above (superficial layer). Between them passes the transverse facial branch of the temporal artery. Filaments of the facial nerve lie also in this position. By tracing the latter structure backward, or by freely elevating the fascia and the superficial lobules of the parotid gland from the position of the venules which are constantly found lying directly in front of the auditory meatus, the entire *pes anserinus* can be displayed.

The position of the firm masseteric fascia prevents the masseter muscle receiving its arteries and nerves from in front. The entrance of the artery into the muscle at the sigmoid notch caused Velpeau* to assert that in dislocation of the lower jaw it is of necessity compressed.

The Arteries.—These are the branches of the *temporal*, and the origin of the *internal maxillary.* The temporal branches are three in number: the *anterior* and *posterior branches* of the superficial temporal proper, and the *middle branch*, which lies upon the outer side of the temporal muscle beneath the aponeurosis, which it pierces.

The pulsation of the anterior temporal is felt readily by the finger. It is said to be more conspicuous in the aged.

The remarkable position of the middle temporal artery is the same as that of the middle temporal vein. It is difficult to understand why parts so near the internal maxillary should have been directed inward from a superficial trunk, and compelled in order so to do to perforate an unusually resisting aponeurosis. It is probable that so significant a feature will be explicable only when the development of the parts is studied.

The deep temporal arteries, branches of the internal maxillary, pass upward along the floor of the temporal fossa, and supply the deeper parts of the muscle of the same name.

The great meningeal artery, usually not associated with the temple, may at times enter into an important surgical question. The vessel may not simply lie in a groove upon the inner surface of the parietal bone, but may be inclosed in a canal, which, as it passes upwards, approaches the outer wall of the skull. It follows that wounds of the scalp in the temporal region may be followed by hemorrhage from this artery without implying a fracture or other lesion of the skull. Begin and Krimer† have recorded a case of aneurism of this artery.

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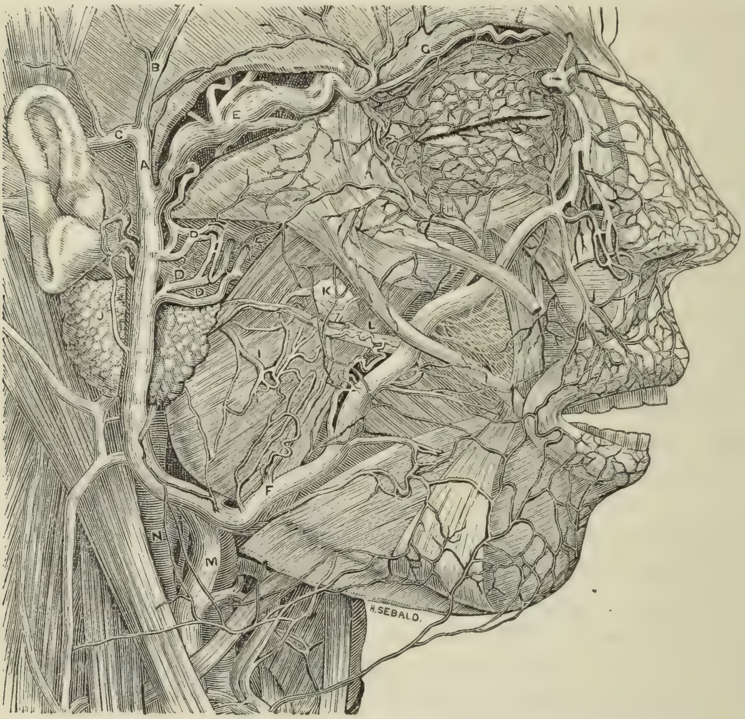
* Chir. Anat., i., 80.

† Gazette Medicale, 1843, 530.

The Veins.—The names of the veins of the temple are the same as those just given to the arteries, and answer to them in position.

The union of the *internal maxillary vein* (Fig. 6) with the *temporal*, constitutes the *temporo-maxillary vein.* This lies within the parotid gland, about on a level with the ascending ramus of the lower jaw.

FIG. 6.—THE VEINS OF THE REGION OF THE TEMPLE, ETC., DESIGNED ESPECIALLY TO SHOW THE TEMPORO-MAXILLARY VEIN AND ITS TRIBUTARIES.



A, temporal vein receiving the anterior and posterior temporal (B, C); D, D, the internal maxillary veins, emptying into the temporal to form the temporo-maxillary veins; E, the middle temporal vein (slightly enlarged), to display which the deep temporal fascia over it has been removed; F, the facial vein; G, the supra-orbital branch, uniting with the middle temporal vein; H, the inferior palpebral vein, uniting with the same; I, the masseteric vein; J, the parotid gland; K, the socia parotidis; L, the parotid duct; M, the external jugular vein; N, the internal jugular vein.

As is commonly the case within the facial region, the venous anastomosis is very free. We see for example the veins communicating with the *facial*, *ophthalmic*, *frontal*, and *occipital* veins, while numerous subordinate branches unite with one another on the face. A glance at the Fig. (6) will give a proper estimate of the degree of this anastomosis better than can be done by an elaborate description.

We would invite particular attention to the intimate connections seen between the branches of the internal maxillary vein. The main trunk, as it approaches the temporal vein, may assume a plexiform appearance, best seen in the zygomatic fossa between the temporal and pterygoid muscles. It is a cavernous plexus, which surrounds the branches of the inferior maxillary nerve, and which communicates with veins passing through the oral foramen from the encranial cavernous sinus.

The pharyngeal vein, with the return blood from the soft palate, lies along the course of the pharyngeal artery. It receives some tributaries from the spinous and oval foramina, and empties into the external jugular at the lower end of the gland.

The minute vein found lying along the parotid duct is a good guide, since it is constantly seen in dissection, as the *temporo-facial* vein near the angle of the jaw is a good point to remember in studying the relations of the cervical lobule of the parotid.

Noticeable among the many striking features of the venous supply of the temple and the parotid region is the *middle temporal vein*, already mentioned in speaking of the artery of the same name.

It will be observed (Fig. 6) that this vessel is of relatively large calibre, and is in direct continuity with the supra-orbital vein.

This circumstance, in connection with its method of termination through the temporal aponeurosis, renders it liable in inflammation at the lids, particularly the upper, to become engorged. Hence the fullness about the brow in ophthalmia, and the indication for local depletion at the brow for some phases of this disease.

M. Billroth has described* an example of a congenital plexiform "neurofibromatous" tumor of the "upper eyelid and temple." The patient, a young man about eighteen years old, occupation that of a waiter, exhibited an obtuse swelling of the left temple, which extended thence to the upper eyelid, completely closing and distorting the palpebral fissure. When the lid was elevated by the hand the vision was observed to be normal, and the motions of the ball perfect. The swelling was not abruptly defined, but involved to a slight degree the fat of the orbit and temporal fossa. The diseased growth was associated with a small point of defective ossification in the left parietal bone. The tumor was successfully removed, and did not recur. Here we have, undoubtedly, a congenital growth extending along the course of the middle temporal vein (although the fact is not mentioned by the recorder) and is an instance of an abnormal process depending for its interpretation upon a knowledge of anatomy.

Plexiform nævus of the parotid gland is sometimes seen. It is always a serious disease, not only from the difficulties attending an operation for its removal, but in consequence of the pressure often exerted upon the pharynx and associated parts. Mr. Gascoyon[*] has recorded a case of this disease which caused death by suffocation.

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* Beiträge zur Geschwuestlehre Langenbeck's Archiv für klinische Chirurgie, 1869, 232.

The Lymphatics.—The lymphatic glands of this region are of two sets: the superficial and deep. Those within the parotid gland are of the most importance. They are found along the course of the temporo-facial vein, the upper portion of the external carotid artery, and between the gland and the side of the pharynx. Their liability to enlargement and the important element thereby introduced into the study of parotid tumors are acknowledged.

They are subject to the secondary engorgement common to lymphatic glands elsewhere. Thus Humphry[†] mentions epithelial cancer of the temple enlarging the glands within the parotid and about the angle of the jaw.

Hyrtl describes one or two which are constantly present near the *socia parotidis.*

(To be continued.)

CASES IN WHICH SMOOTH POINTS ARE INDISPENSABLE TO THE BEST RESULTS IN FILLING TEETH.

BY W. E. DRISCOLL, BEDFORD, INDIANA.

WHO has not at times experienced the annoyance incident to having a small filling (one of those which "anybody can make") drop out just as it was about finished, or a short time after? Those who have not can skip this, as it would not be worth their time to read it.

The time was, however, when I would have been thankful if some one had told me what I now hope to make plain to the *few* that need such assistance.

Some small cavities, when difficult of approach, are much harder to fill than if they were larger. When we essay to fill such with the serrated points, often, notwithstanding our best efforts to the contrary, we build up a hard lump of gold in the middle or at one side of the cavity, until it is nearly full, when an unlucky movement loosens the whole or a large part of the filling, and very often in such a way that it cannot be made secure again, even if it were good practice to try to retain it after having been once moved from its first position.

I say, when we try to fill such cavities with serrated points this happens. One might do the same thing with smooth points, but it would be about as difficult to bring about such a result with them as it is to avoid it with the serrated ones. Why? Because you cannot easily prevent a smooth point from slipping into the lowest or softest parts of the plug, and filling them up level, while the serrations and the kind of surface they leave on the plug, make it very nearly impossible to slide small additions of gold into the more intricate parts of the cavity. This seems very simple and evident, but there are very many who do not know anything of the advantages of the smooth points.

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[*] Trans. Path. Soc. Lond., 1860, xi., 267.

[†] Med. Times and Gazette, 1861, 522.

It is best to begin, in learning to use them, with the smallest point you can do anything with, so that it has a well-defined flat face. A coarse corundum wheel will leave a very good finish for the point. The shank should be a little smaller than the immediate point, and straight or nearly so, as it must be too small to bear much curving.

With this kind of point you can fill your small cavities and retaining points so securely that every particle of gold will have to be drilled out, if it comes out at all. And in weak lateral incisors especially, you can get along with retaining points less than half as large as is required if you use serrated points. Why? Because the smooth points spread the gold out solidly against the walls of the retaining point, while a serrated point will build up a hard column in the middle or near one side, that can be easily pulled out any time before it is united with the gold in other retaining points, or from being loose in the retaining point it is not so thoroughly and strongly welded as when the retaining point is filled perfectly from the bottom.

There has been a very interesting discussion through the dental journals between Drs. Dean and Hunter as to the best shape to keep the surface of large fillings while introducing the gold. I will risk the assertion that it makes little difference which plan is observed, if the edges of such cavities are gone over with one of these small smooth points, and a small strip of "Globe" or other foil having its quality of burnishing down easily be carefully malleted in until no more can be got down to a level with the rest of the plug; and as often, while the filling is being made, as any impression can be made upon the edge of the filling, this should be repeated. If the walls are weak, however, I should recommend keeping the surface of the filling as flat and even as possible, which will also be rather the more convenient way in all cases.

I do not use smooth points exclusively. I do not like them as well as the Varney serrations in building up a contour plug after I get outside of the walls of the cavity, and also when I do not want the gold to spread under the plugger. But that one can fill small cavities and retaining points much better and easier,—that the gold can be adapted more perfectly to frail walls with the smooth points,—I am most positive. I wish to prevail upon those who have not tried the plan here suggested to do so at once. It will pay.

PROCEEDINGS OF DENTAL SOCIETIES.

SOUTHERN DENTAL ASSOCIATION.

(Continued from page 520.)

THIRD DAY—*Morning Session.*

THE subject of Operative Dentistry was taken up.

Dr. McQuillen said: In the course of the discussion yesterday afternoon, some of the speakers said that it did not pay to introduce contour fillings. Uttered, as this was, in the presence of a number of young practitioners and students, I would say that there is no class of operations the dentist is called upon to perform which affords the young man greater opportunity to render valuable service to his patients and make reputation for himself than in this direction, and that, if true to himself and his patients, though located in a small village, or in an obscure street in a great city, he will ere long attract attention, and secure a leading position in the profession. In the fall of 1847, a young man who had studied with the same preceptor I was then under came to Philadelphia from Lancaster, where he had been in practice for a short time, bringing with him some teeth which he had filled. They were what are now called contour fillings, and were very perfect and beautiful specimens of artistic dentistry. They attracted the attention of a gentleman by the name of Dr. Clark, who had been residing in Paris for some years. He sought an interview with the young man, and said he had been commissioned by Dr. Brewster, of Paris, to secure the services of a skillful young American dentist, and that if he would accompany him to France his fortune was made. The offer was accepted, and the young man became dentist to Louis Philippe, and to a large number of the notables of Europe, and, after the revolution, to the Prince President Louis Napoleon, holding the same position after the *coup d'état* to the Emperor, and is now estimated to be worth millions of dollars. Such, in a few brief words, is the history of Dr. Thomas W. Evans, and it is offered to young men as evidence that it does pay to do such work, even when viewed from the pecuniary stand-point.

Dr. Clark. This doing the right thing is just what I want; it is the greatest aim of my life; but what is the right thing? We may differ in regard to this; but, if a man is not conscientious, he is not doing the right thing. Now, many think they are doing the right thing when they are not, as in the case of those who conscientiously put in mercurial fillings, when they were ruining the teeth by such a measure. And again, Dr. Atkinson once used denticulated instruments, but now uses smooth points. Thus our views change. Now, Dr. McQuillen believes that contour fillings are the right thing. I am convinced that they are the wrong thing. It will not do for Dr. McQuillen and Dr. Atkinson to get up here and dictate to us what we shall do. They must acknowledge that we are entitled to our views of what is right. Now, I say that contour fillings will not save the teeth, and it is not for ornamental purposes that gold is introduced into the teeth. I don't want to see gold glittering in the mouth. Put in those fillings that will preserve the teeth. Again, I ask, is it doing the right thing to put in a filling for a young man struggling in life, for which you charge him one hundred dollars? I say it is not right. In regard to the plan of removing those portions of the tooth-structure where caries may be expected, I would say that where we can anticipate decay it is proper to do it. I believe experienced operators can anticipate it, though it requires the experience of ten or fifteen years to acquire this. I saw this morning a beautiful, magnificent filling put in. I could have taken that tooth and filled it in one-fourth the time, and filled it so that the tooth would have been preserved much longer.

Dr. Walker. The right thing is to fulfill the dictates of one's own conscience. We are constantly advancing. The right thing is constantly in advance of us. The man who does not rise above petty considerations is not fit for this profession. When, from the nature of the case, contour fillings are required to give the full amount of masticating surface, then they should be resorted to. The patient, however, must take care of them. There are two things that are needed in the profession,—first, a knowledge of what is necessary to produce good teeth, so that children may be born well; dentists should only be advisers, and the time will come when they will have but little operating to do; and secondly, we need a material for filling that will take hold of the tooth and give us a vitreous surface. This must come; gold will not do.

Dr. Foster thought that too much attention was paid to merely filling teeth, and not enough to irregularities of teeth.

Some conversational discussion then followed between Drs. Hickman and Clark, in regard to the filling of the tooth to which the latter had referred.

Dr. Stellwagen said that in all cases they should be governed by great principles. He thought Dr. McQuillen was misunderstood when he was supposed to advocate contour fillings to the exclusion of all other methods of operating. He then went on to speak in favor of bridging, and, by request, demonstrated on the blackboard his method of operating under certain conditions.

The discussion then drifted into conversation. In answer to a question from Dr. Clark, Dr. Stellwagen stated that if a patient was of a lymphatic temperament, he would prefer rapid wedging; but, if the teeth were bedded in solid processes, or the patient exceedingly nervous, he would persuade them apart.

Dr. Atkinson stated that he would separate any tooth without injury, and not use more than five or ten minutes.

Dr. McQuillen. I only rise to make an explanation. Dr. Clark certainly did not hear what I said. I distinctly stated that I was in favor of eclectic practice. Again, I am not here to dictate. I am here by invitation of the Association, and no man is less disposed to take advantage of his position as a teacher. Respecting the opinions of others, I claim the right to give utterance to my own views, not dogmatically but suggestively, expecting them to be adopted only when they appear to be founded in fact and reason.

Dr. Guilford said that the highest duty was the preservation of the teeth. He spoke in favor of the extraction of the six-year molar, in order to give room for other teeth, and prevent irregularities which had brought him more trouble and less money than anything else. He would not, however, extract after twelve years of age. He claimed to be eclectic in his practice, and said that he did what he thought best in every particular case. He thought, further, that the race had deteriorated.

Dr. Chupein said that a great cause of irregularities in teeth resulted from the mixing of races and nations. A German, for instance, with his wide jaws, unites with an Italian of narrow jaws, and the child, according to the law of heredity, is not a homogeneous mean between the two, but possesses, perhaps, the narrow jaw of the one with the large teeth of the other.

Dr. Noble made a few remarks in regard to the use of the mouth glass. He thought not enough attention was paid to this. Dentists should become so familiar with the use of the glass as to be able to use it under all circumstances.

Dr. M. H. Webb said: In addition to what has been said in advocacy of contour fillings, I desire to say that frequently the advance of dental caries, in the mouths of those whom we have not had in charge when such decay was in its incipiency, has been such that the patient was unaware of such abnormal condition, or, being conscious of it, does not seek the services of a dentist until a fracture occurs or pain ensues. When two teeth are thus attacked by caries where they come into apposition, the cavity in the one should be well prepared, filled, and finished, and then the other. Restore the proper contour of both, so that when the teeth approximate, the most prominent portion of the fillings will come in contact, and that the entire margin against which the gold is packed may be free, thus making the parts self-cleansing from the action of the muscles of the cheek and tongue. No dentine is then exposed, and if the operation be thoroughly completed, caries will not often recur, even if due cleanliness be not observed, which observance is absolutely necessary, for a considerable time at least, when permanent separations, requiring removal of enamel and often exposure of dentine, are practiced successfully. Maintain the same care in keeping the proximal surfaces of teeth cleansed and polished from eruption without permanent separation, as must be done after the same is accomplished, and the enamel, as naturally formed and presented, will most assuredly not yield to destructive agents, but become more dense as years pass by, and caries will thus be prevented. When cavities present in the proximal surfaces of bicuspids or molars where a considerable portion has been destroyed, it is quite frequently necessary to cut away some of the attenuated buccal, as well as the palatal wall of enamel. In such case it is best to restore the contour and allow the tooth, when filled, to come into apposition with the next in the arch at the curvature of the base of the buccal cusp thus built out. A separation is thus made toward the necks of the teeth as in nature, and as caries frequently extends along the dentine underneath the plate of enamel, so as to involve the whole of the proximal surface to the cementum, and the latter possessing the vitality to resist decay, it is quite certain that those parts will not again suffer from an attack of destructive agents if the operation of preparing and filling the cavity and restoring the contour be thoroughly completed. The food, which may be pressed toward the gum during mastication, on entering the V-shaped space thus made, is, or can be, readily dislodged, but when forced between the parts of the teeth in apposition when the double V-separation is made, it is often retained at the necks of the teeth, and if not removed caries may ensue, such removal, at times, being difficult for the patient to accomplish. When these separations are made by, or the case is in the care of, an unskillful or careless operator, or where the patient is one who will not preserve the cleanliness necessary, one can readily foresee failure. These failures will thus occur from time to time, and frequently until they will outnumber those from first-class operations in ordinary cavities without permanent separation, or from good, solid, artistic, contour fillings. There are cases where the palatal wall of an incisor or cuspid tooth has not been affected by caries sufficiently to cause any injury to the enamel, while that of the labial surface is very brittle and often fractured, the opaque decay being plainly visible. Very many practitioners object to exposure of gold, and rightly so too where the exposure can possibly be avoided; but what shall be done when such a case as this presents? Resort to extraction? No, never, so long as a root remains with its peridental membrane and cementum in a normal condition. Build a crown of gold, with a porcelain face, upon such roots, or place one of porcelain upon them by the operation known as "pivoting." If quite a number of roots remain, or if some are missing from the anterior alveolar process, then extraction and the adaptation of teeth on a plate may be advisable.

The best one can do when a case presents where the labial wall of enamel is fractured, or a portion of an incisor or cuspid tooth is lost, is to make the edges regular, restore the proper contour with a *solid* gold filling, and finish perfectly, when, with all indentations obliterated, such a filling will present an appearance as if burnished, though, under such circumstances, this burnishing should generally be dispensed with. Such an operation, well performed, is decidedly preferable to that where quite a space remains in consequence of the cutting away of tooth substance, often because of inability to perform a really good, artistic operation, but professedly to avoid exposure of gold, while at the same time a lateral view reveals quite as much as otherwise, and the unnecessary space remains to mar the appearance not only of the other teeth, but of the face.

The subject of Operative Dentistry was then passed.

Profs. Jos. Jones, of New Orleans Medical College, and T. O. Summers, of Southern University, Alabama, were elected honorary members.

The subject of Mechanical Dentistry was taken up.

Dr. Johnson thought that the use of rubber ought to be discountenanced until the question is settled.

Dr. Walker stated that the Illinois Association had passed a resolution to abandon rubber, and recommended that the same be done at this association.

Prof. McLain deprecated the influence which rubber had exerted in lowering the tone of the profession, but did not think the association had the right to forbid its use.

Dr. Walker stated that the measure recommended was only advisory.

Dr. Coy introduced a resolution covering the case, but on motion it was laid on the table.

The association then adjourned to an excursion on the Chesapeake Bay. There was consequently no afternoon session.

Fourth Day—*Morning Session.*

The association met at the appointed hour. The discussion on the subject of Mechanical Dentistry was renewed.

Dr. Winder spoke in regard to celluloid. He referred to the flakiness which occurred in this substance—a fact which the manufacturers themselves admitted, and on this account they were willing to exchange good celluloid for any that might develop this flakiness in the hands of the dentist. In his experience it had met with entire satisfaction except in one case. He regarded it as almost unequaled as a base for plain teeth. There was one serious difficulty, however, and that was, in gum teeth it would crack and break the gums.

He was informed by Dr. S. S. White that he had declined to offer this substance to the dental profession unless an assignment of the right to sell it for dental uses was made to him. This was necessary to guard the profession from abuse in case the ownership of the patent should pass into antagonistic hands. The company have bound themselves to keep a supply equal to the demand, and in case they fail to do so, Dr. White has the right to make it. He spoke of using oil in working the celluloid, which to a great extent obviated the difficulty referred to.

Dr. Waters stated that, by using a tin model and over that a plate of chemically pure tin, he got rid of that flaky appearance. The tin absorbed the gases which were the cause of the flakiness.

The question as to the validity of the Goodyear patent having been sprung, Dr. Winder said that as a member of the executive committee he had had occasion to post himself in regard to the matter. It was found to be so mixed that it was hard to unravel it. The patent of Chas. Goodyear was accepted by them as covering the application of heat to rubber. Goodyear only claimed the working of rubber over dry heat, but in his European patent he claimed moist heat also. Dr. Gunning is of the opinion that he cannot claim the application of the patent to vulcanite, for they had experimented with it from forty minutes to nineteen hours, and did not succeed with dry heat. He was of the opinion that the company had been palming off the European patent upon the American profession, for the plate could not be produced by dry heat.

Dr. Coy spoke of the combination of gold with celluloid to prevent shrinkage. He said the gold would be sprung by the celluloid, for the latter would shrink.

Dr. Gorgas said that he was not satisfied with celluloid. It was not comparable to rubber. It was almost impossible to use it with gum teeth; with plain teeth it was very good. He had confined his practice to the insertion of full sets, and then the gums would crack.

Dr. Alfred said that he had experimented a little with celluloid. He first made a plate out of type-metal and filed one side down level, and packed the celluloid on that. When cold he filed it even. When finished there was no rocking. In three or four days, however, there was a little motion; in a few days a little more, until at length it was like the rocker to a cradle. He then made a set and filled it with plaster, thus obtaining a perfect fit. In three or four weeks he couldn't get the plaster in, it was so contracted. He had also noticed that if a patient got sick and laid the plate away for some time, when well he could not use it on account of the shrinkage.

Dr. Clark said that about six months ago a gentleman called upon him and asked as a favor that he would examine his set of teeth. He did so; found it had a cradle rock, and observed that it was a singular fit. The gentleman said that he had worn it for six months with perfect satisfaction, when, some inconveniences in wearing it having been experienced, he carried it to the dentist who made the plate. He kept it three or four days, and when the gentleman returned for it he found he could not wear it, and suspected the dentist of foul play in order to get the job of making a new set. Dr. Clark said that he would let the gentleman know what had been developed here, as he believed the dentist to be an honest man.

Dr. Grant said that last November he made up a set of celluloid. White specks appeared on it, which became porous, and the surface became very rough. He also had a case in which a lady wearing a set became sick, and after recovery could not wear her teeth, which she had taken out during her illness. Dr. Grant had attributed it to the effect of the disease upon the mucous membrane of the mouth, but was now convinced that it was shrinkage.

Dr. Alfred thought that it was more of a warping than shrinkage.

Dr. Walker said that he did not use rubber. He was convinced that in nineteen cases out of twenty disease was produced. He thought the chief difficulty in regard to celluloid was not the warping, but the giving way and not holding the teeth. He used water in working it. He preferred a metallic base. He had been better satisfied with tin one part, bismuth thirty parts, than anything else. This he said would resist the action of acids and other deleterious agents.

Dr. Gorgas recommended the use of tin vulcanized over.

Dr. Turney presented a case of irregularity, which was discussed upon the model, after which the subject was passed.

The report on Dental Literature was presented, and received without discussion. The subject of Dental Education was taken up, and Dr. Floyd presented a paper, which was read.

Dr. Arthur said: I have something to say on this subject. It is a subject of great importance. What are we here for? To advance our own personal interests? Now, every man has a right to his own opinion of what is right; but all men are not aware of what is the best way to proceed. Taking care of number one has an influence on men which sometimes leads to great success. The man who robs attains his end. But, we must look on the views of others, and recognize their rights. We occupy a position of great importance; dentistry is a specialty of medicine. It is our wish that all should be able to perform good operations. How is dentistry practiced? Badly, as a general thing. Now, I have no stilted standard of contour fillings; but I do desire that all shall be capable of performing good operations. But look at the mass of the profession, and you will find that they are not capable of practicing dentistry as it should be done. Where does the responsibility lie? We say it cannot be helped. Is that so?

We are suffering under an evil the remedy for which lies in ourselves. Now, why do we whine thus under difficulties? "Who would be free, *himself* must strike the blow." I have no personal feelings in this matter. I have declined connection with any institution, and hence I am free to speak as I think. It is the business of the profession to scrutinize closely the dental colleges, and if it can be fixed upon any institution that they have turned out unworthy men, let them be repudiated by the profession. I have met a case of a student who had been two years at college and was in practice, and I tell you he couldn't fill the crown cavity of a molar tooth. Since that time, however, he has become well fitted for practice. But now look at this. If an institution can do this, we know what we have to expect. The remedy lies with us. Both dentistry and medicine have complained of this for some time. The medical profession have been laboring to stop it, but they say they can't help it; they teach the best they can. But it is in their power to stop it by throwing their influence in favor of a college that is properly conducted. Let an institution be established in which the standard shall be high, and let all this bidding for students be stopped. Whatever may be done, let us turn our faces against this indiscriminate turning out of students who are not fit to practice their profession. In conclusion, I would say that I disclaim any desire to reflect on any particular institution. I speak in general terms.

Prof. Noel. I agree with Dr. Arthur in everything he has said. If we take the medical profession, we will find that at their last two or three national meetings attempts have been made to raise the standard of the profession; but the question has been shunned; they dread it, and the matter has generally ended by reference to a committee. I know but one single institution where the standard is properly kept up, and that is the University of Virginia. In the medical class in which I graduated at that institution there were one hundred and eight applicants, and from these only eight were graduated. On account of its high standard it is losing its class. The fault lies in the American people. If a college is endowed, then there is no difficulty in keeping up the standard, for then the institution is independent of students. More of anatomy and physiology and chemistry should be taught in the colleges. In regard to the teaching, I think the lecturer should be on the stand at the appointed hour without fail, and should be held responsible to his class for his appearance at that time. And just here I would say a word in regard to this lecturing against time. Professors come into the lecture-room without preparation, and then try to fill up the time in discursive talk. This will not do; it is of no benefit whatever to the class.

The point I wish to make is simply this: that in order to raise the standard of graduation you must raise the standard of teaching. Professors are too much in the habit of presenting before the class a *rudis indigestaque moles.* My plan is to present on the blackboard the syllabus of every lecture. This is carried away by the students each day. In this way I cannot wander, but am compelled to proceed logically according to the prepared syllabus. My students tell me that physiology, generally considered the hardest study in the course, is easy to them, and I have reason to be proud of my students, and I attribute their progress to this definiteness which I observe in my teaching. Both medical and dental education is low, but it can be raised by the professors. We have got to turn to thinking. It is the honesty of the professor that determines the quality of students turned out from his teaching. No collection of outside men can raise the standard. This rests with the professors themselves. These are the results of seven years' teaching, and I believe them to be practical and correct.

Prof. McLain. One thing is certain: the curriculum is too low. Two years is insufficient for any one to learn the profession who comes to the schools, as do most of the students, perfectly raw, and not even acquainted with the terminology. The term should be lengthened to three or four years.

Dr. Clark. I am on the fence in regard to this matter. I have no personal interest at stake; I therefore speak freely. The whole thing is in chaos, and whose fault is it? Does it lie with the profession at large, or with the colleges? For three or four years we have been attempting to unravel this. The Georgia State Society brought it before the society at Richmond. We saw the trouble: the colleges were all like drowning men, fighting for students. Look at their catalogues—at their efforts to get in advance of each other in point of numbers. A plan was devised by which, with the support of this association concentrated on one college, we thought we could bring up the standard of education. How well that plan succeeded, let the colleges concerned themselves say. It shows, however, that they are at fault, and not the profession; that they are not willing, as they should be, to lay themselves at the feet of the profession. Instead of pursuing this course, they are willing to occupy the position of mere existences. Ask where are their buildings, do they belong to the schools? and you will find that they are mere apologies for dental schools, and rented for teaching purposes, and then dubbed *Dental Colleges.* The time has come when we must give them an awful letting-alone and erect one of our own. The colleges in existence do not come up to the standard of the profession. Out of courtesy we have been afraid to speak out; but we should keep quiet no longer.

Dr. Clark then called for the report of the committee appointed at the last meeting, to enter into negotiations with the dental colleges, so as to bring them under the control of the Southern Dental Association, and stated that one gentleman he knew of was willing to pay two thousand dollars towards endowing a dental college.

Dr. Grant, chairman of the Committee (Prof. Gorgas in the chair), read the report, which stated that the committee had written to the Baltimore College of Dental Surgery, and to the New Orleans Dental College. Both of them rejected the request of the committee. The Baltimore College offered to the association the endowment of a Professorship in Histology and Microscopy. Nothing has therefore been effected by the committee.

Prof. McQuillen. At a meeting of the American Medical Association held several years ago, Prof. Daniel Drake, an eminent medical teacher, said, when medical education was under discussion, that he had a right to speak on that subject, for he had been connected with and resigned from more medical faculties than any other person in the profession. The extended experience of that distinguished man has not fallen to my lot, but I can claim to have had as long and as varied an experience as a teacher, in connection with dental colleges, as any one present. This experience, embracing a period of seventeen years, has taught me among other things one important fact, viz. that the occupancy of a professorship in a dental college is an expensive privilege, and that no one will continue to hold such a position year after year, unless, animated by an earnest desire to elevate the profession, he is willing to make sacrifices of time, money, ease, and pleasure, which very few are willing to do. Only those will continue to teach for a lengthened period whose hearts are in the cause. I have known men, whose abilities and attainments eminently fitted them as teachers, after a few years of valuable service to the profession, to retire from the position on account of the tax upon time, interference with practice, exhausted energies, or failing health; leaving it with regret, they have, however, continued enthusiastic advocates of dental colleges. One of the gentlemen who preceded me gave his experience as a student and teacher; following his example, permit me to present mine. As a graduate of one of the largest and most respected medical colleges in the country, my experience as a student and the continued opportunities of observing the methods of teaching in medical colleges of later years convince me that the curriculum of instruction in properly organized dental colleges will not only bear a favorable comparison with those institutions in what is attempted to be taught, but that the *theoretical* and *practical* are more thoroughly combined than it is possible to do in general medical and surgical instruction. (Dr. McQuillen then gave his experience in connection with two dental colleges, remarking in the course of it that in the establishment of such institutions the aim of the founders should be not merely to meet the demands of the present but the wants of the future.) With regard to the charge that the colleges are antagonistic and bidding for students, I would say that if enlarging the opportunities for study and practice in the colleges for the students, from four to six and then to nine months, be regarded in that light, the charge may be admitted, but in no other way does it hold good. One of the speakers said that the dental profession had advanced and the colleges had not. I would ask, is he familiar with the dental colleges as they were years ago, with regard to means of illustration and methods of teaching, and as they are now, from personal examination of all the institutions? I remember them in the beginning with insignificant specimens, old and inexpensive apparatus to illustrate the lectures of gentlemen who fully appreciated how difficult it was to make their students comprehend what they were endeavoring to impart to them under such circumstances. Now, contrasting this with the extensive and valuable museums, the specimens purchased by individual members of the faculties at great cost, the care and attention that is paid to illustrating to the fullest extent every subject presented, and these facts, along with the improved clinical advantages, prove that the colleges have not remained stationary, but have advanced. Again, in the advancement of the profession, have the professors of dental colleges been idle? Who have edited the dental journals? Who have been more active and indefatigable contributors to the literature of the profession, or taken a more prominent part in organizing and attending dental societies, local, State, and national? I allude to this to prove that they have done their part in the progressive development of the profession. While thus speaking in defense of dental colleges, no one recognizes more fully their deficiencies than I do; but when it is borne in remembrance that what has been accomplished in this direction has been through the exertions of a few men, who have had no aid from municipal or State government or the munificence of private individuals, one may justly say criticism is easy, execution difficult. Turning the tables, I would ask, What are the practitioners of dentistry doing individually with regard to the education of the profession? Is it not true that a man can enter many dental offices, and after a short period, a few weeks or months at best, during which he has had few if any opportunities beyond those afforded in the laboratory of learning anything about dentistry, engage at once in practice, with a certificate from his preceptor endorsing his competency? Are those who so freely criticise dental colleges doing their part as private preceptors? Do they inquire into the mental, moral, and physical qualities of those whom they receive as private students, supply them with the latest and best text-books, direct their course of reading, and subject them to stated examinations to ascertain what progress they have made, and to correct erroneous impressions which they may have formed? The yearly additions to the profession are mainly through private preceptors, who fail to do their duty by those who come under them as students, and but a small number attend college and graduate. The alumni of the dental colleges have done much toward the advancement of the profession during the past few years. For years I have advocated the enactment of State laws which would make it obligatory upon students of dentistry that they should undergo two years of private preceptorship, attend two full courses of lectures, and graduate from a respectable dental college before entering upon practice. With reference to the charge of looseness in passing men through the colleges, if true of some, it does not hold good against all. Speaking for the one with which I have the honor to be connected, the faculty have been exceedingly careful on this point, and conferred the degree only upon those who have passed a thorough examination. The endowment of dental colleges is a movement in the right direction. But who are sufficiently liberal to do it? Have you any idea of the expenses attendant upon a single session? Four other gentlemen and myself paid $700 apiece, $3,500 in the aggregate, to deliver the first course of lectures in the Philadelphia Dental College to *eleven students.* This money was cash advanced, and did not include the cost of valuable specimens, apparatus, etc., used, nor the loss of time in practice. The receipts from the students who attended the *second term* were nearly sufficient to cover the expenses, and an additional assessment of *only* $50 on each member of the faculty ($250 in all) was required for the privilege of delivering that course of lectures. Each succeeding year valuable specimens and apparatus have been added to the museum; and in anticipation of the eighth session, the faculty made additions and improvements in the college which cost $4000, and lectured that session without any pecuniary return. Can those who are so ready to criticise dental colleges show a better record in behalf of dental education? It would take at least $250,000 to properly endow a dental college; the interest to be devoted to paying the expenses of the institution, including the professors and demonstrators' fees.

Prof. McLain. Being connected with the New Orleans Dental College, one of the colleges concerned in the consolidating movement referred to by Dr. Clark, I feel it my duty to place it in a right light before this association. I conceive that this association has a right to dictate to the colleges, but when the resolution to consolidate the Baltimore and New Orleans Dental Colleges came up, there seemed to be a disposition to wipe us out of existence. We are sorry to have hurt the feelings of any one on this point, but we feel the great importance of keeping up the New Orleans College, as Texas, Louisiana, Mississippi, and Alabama look to this as their most convenient point. If that project were carried out, and the New Orleans College absorbed, another would spring up in its place.

Dr. Gorgas said: This proposition from the Southern Dental Association was received by the Baltimore Dental College, considered, and respectfully answered. The first question which presented itself to our minds was, is the Southern Dental Association able to take upon itself the support of any one institution? Here are one hundred and twenty-seven members belonging to this association. I was one of its founders,—was the first recording secretary, framed its constitution, and hence any proposition from it would be favorably considered by me. But upon consultation we decided that you were not able to support an institution. But we placed it in your power to endow a chair in the institution. The gentlemen concerned know that I was willing to withdraw whenever a better man was proposed. Prof. Cutler was named, because we believed he would be generally acceptable, and would bring about a more harmonious consolidation. This is a true statement of the case. I am no aspirant for office. I was surprised when I was elevated to the office of first vice-president of this association. What I have done has been done in honesty. I have not neglected any means in my power to advance the educational interests of the profession. Wherein I have been found wanting, it was a want of ability, not neglect.

Dr. Arthur said there was a great deal of irregularity somewhere, and it should be well ventilated. Among the mass of the profession there were but few reliable dentists to be found. It is a matter of indifference where the institution is established, or how long the students stay, so they acquire the education necessary to fit them for practice. The profession should rise above all this petty sentimental respect for one's alma mater. The guilty should be condemned, no matter where they are found.

Dr. Walker spoke of the advantages of New Orleans as a great center—a section of country whose young men would not have the opportunity to attend a dental institution if one were not established there. He thought the association was not able to support a dental college, though by judicious co-operation it can accomplish much.

Prof. Stellwagen. I should feel some delicacy in speaking upon this subject, only that the institution with which I have the honor to be connected, the Philadelphia Dental College, is not under consideration, and therefore not directly interested. Any man who truly labors to elevate the profession is a real friend; yet it has been proposed here to make them hirelings, and bring them to your feet! Could those who would thus sell their manhood be intrusted with the instruction of the future dentists? It is a fact that some of the flourishing colleges of Europe are endowed; but if this makes their success, how will you account for the present condition of the once leading schools of Bologna?

True merit would never submit to be pensioned on such a pittance as you offer, when humbled and enslaved by such conditions. Nor will crimination and recrimination elevate the profession. I cannot sit calmly down and see men, who have struggled with their might and freely expended of their meagre stores of money to carry on their institutions, thus unjustly dealt with. I am astonished at the innuendoes so freely thrown out, as if it was a pecuniary advantage to be connected with a dental school; at the unblushing ignorance as to the amount of money necessary to defray the actual expenses of teaching; at the miserable attempts to ridicule faculties because they do not own in fee simple, but rent, the buildings in which their lectures are delivered. Had the men composing these faculties spent their energies more for self and less for their profession, they would not to-day be accused of poverty, a poverty that in itself entitles them to respectful consideration, and which is honorable since it is unselfish and humanitarian.

The profession must be uplifted by the individual effort of each man, and not by the charlatanry of self-aggrandizement at the expense of each other's fair fame. Let each remember that he owes a duty to his professional brothers, and that he is accountable to his profession and his God.

Dental schools must not be at the mercy of either their endowers or self-constituted trustees; far better that they should take their chances as at present chartered, than be made the tools of manufacturers, publishers, authors, or those ambitious of a little brief authority. The great object must be to afford a means of obtaining a substantial and thorough education; it matters but little where this is to be found or how long it has taken,—only we know that a dentist cannot be made within a few brief weeks of tuition. Then let us all unite in the determination to cast aside petty jealousies as unworthy of our noble calling; let us strive to place dentistry still higher upon the hill of science, and, as in the past so in the future, banish all but honorable efforts to secure true merit in our ranks, and be governed by the highest respect for each other in our professional intercourse.

Gentlemen of the Southern Dental Association, I am not honored by membership in your body, but I love and admire all who are rightly seeking for truth, and hence feel proud to be permitted to take the floor; but let me add that my dental education was commenced in your section of the country, and I am supported by the knowledge that I have ever had many warm personal friends among you, and am happy to say that no man has more fully enjoyed the hospitality for which you as a people are proverbial, and that I am grateful for the attentions and courtesies you have been pleased to extend to me. Permit me on behalf of my colleagues from Pennsylvania to thank you for your bounteous entertainment and professional consideration.

Dr. Clark said there had been a great deal of spread-eagleism and indefinite bids about the speeches. He found no fault with the number of colleges. Gentlemen seemed to be very sensitive on this subject. They were mistaken, however, when they thought that the association was not able to endow an institution. He knew one member who would give two thousand dollars to such a project.

Afternoon Session.

Dr. Winder announced to the association that they were about establishing another institution in Baltimore, in which they would endeavor to reach a much higher standard than had been ever done before.

Dr. Grant made an explanation in regard to his position as chairman of the Committee on the consolidation of the Baltimore and New Orleans Dental Colleges.

The whole subject was then laid on the table.

Voluntary essays were called for, and Prof. McLain read a paper on the "Action of Deleterious Agents upon the Teeth," which, after an attentive hearing, was received.

The thanks of the association were tendered Dr. S. S. White for his services in regard to the protection of the profession from the unjust claims of the Rubber Company.

The association resolved to pay the secretary annually for his services.

The usual thanks were tendered to those who had favored the association during the present session.

The subject of dental appliances was taken up, and Dr. Arthur said a few words in favor of the Electric Engine and Bonwill Plugger.

The association proceeded to the election of officers, with the following result:

President.—Dr. Robert Arthur, Baltimore.

First Vice-President.—Dr. T. F. Chupein, Charleston, S. C.

Second Vice-President.—Dr. James Johnston, Va.

Third Vice-President.—Dr. E. Floyd, N. C.

Recording Secretary.—Dr. Jas. F. Thompson, Fredericksburg, Va.

Corresponding Secretary.—Dr. Samuel M. Field, Md.

Treasurer.—Dr. J. H. Moore, Richmond, Va.

Executive Committee.—Drs. J. R. Walker, W. N. Morrison, W. G. Redman, J. Taft, and S. J. Cobb.

The association then adjourned, to meet in St. Louis the last Tuesday in July, 1874.

We are requested to supply an omission in the report of the first day's proceedings, viz., that Profs. Williams, Coy, H. H. Keech, E. P. Keech, Winder, Foster, and Field, of the faculty of the Maryland Dental College, were admitted to membership; that Prof. Williams was received as a delegate from the Maryland Dental College, and Prof. H. H. Keech from the Baltimore Pathological Society; and that Prof. Tiffany, of the Maryland Dental College, was made an honorary member.

AMERICAN DENTAL ASSOCIATION.

(Continued from page 529.)

THIRD DAY—*Afternoon Session.*

THE morning being taken up with clinics, the association met at the appointed hour in the afternoon.

The following resolutions were offered by Dr. Walker, and adopted:

Resolved, I. That the recent action of the railroad combination, in so far as it applies to dental, medical, or scientific associations, is not only uncalled for, but highly reprehensible.

Resolved, II. That gentlemen who attend as delegates upon such associations do so at great personal sacrifice for the benefit of humanity and the general public good, and that their influence tends greatly to advance the interests as well as the area of civilization, and by so doing to confer a positive benefit upon railroads, which depend upon the advancement and extension of civilization for their business and welfare.

Resolved, III. That therefore railroads could well afford to pass such delegates to and from their places of meeting, and that their refusal to grant at least free return papers is placing a severe tax upon men who spend much time and labor for the public good which they are ill able to bear, and that such action by the railroads is as short-sighted as it is arrogant and selfish.

Dr. Dean recommended the striking out of the last clause, but it was passed without amendment.

Dr. Eastlack was then called upon for his statement concerning the practice of dentistry in China, which he proceeded to give as follows:

You must not expect me to bring you anything new or fresh in dentistry. I can only bring you my personal experience of the practice in China and Japan. I was in Hong Kong for fifteen years. This is a British colonial dependency. I was confronted by a total want of appreciation of dentistry. My experience has been largely the same as yours. I have had for my patients princes and slaves, Chinese, Siamese, Mohammedans, Turks, Greeks, Austrians, Tartars, representatives from almost every nation. Apart from this, my practice is identical with your own. I might give a very interesting account of my interview with the prince of the country, but this would take up too much of your time. When I went there to practice I was entirely dependent upon my own resources. I built my own chair. All my instruments were manufactured by myself. My patients came to me with marvellous tales of how the Chinese extract teeth without pain. They said they could take out five or six without giving any pain. I determined to investigate the matter. For this purpose I went to Canton. I found them a set of charlatans, mountebanks, and sorcerers, who worked on the credulity and ignorance of the people, and, I am ashamed to say it, there were Europeans who believed in them and submitted to their operations. I endeavored to discover some of their tricks. I found the dentist under a large umbrella, with teeth strung around his neck. This was called the Temple of Horrors. Figures in life-size were hung around, represented as being torn in pieces, boiled in oil, etc. The dentist received me very kindly. I secured some of the white powder which he said was necessary to put around the tooth, and after which the patient coughed, and the tooth came out in his hand. The powder was said to be extracted from the sweat of a horse, but on examination I found it to be arsenic. Their method of curing the toothache is by "extracting the worm," as they say. A gentleman told me he saw the worm in the tooth. They contend that, after penetrating, the worm attacks the blood-vessels. The operation in this case almost defied detection; but I stole the instrument with which he worked, which was a common pair of dissecting forceps, apparently with which he brought out the black maggot and held it up. One of the arms of these forceps was made of bamboo, painted just like the other arm. On compressing this the worm came out. The instrument was placed in the mouth, the worm forced out, and then the forceps reintroduced and the worm taken away. This is the way they influence the natives, and I am sorry to say Europeans are often duped by them. They also make artificial teeth from the tusk of the hippopotamus, carved to a resemblance of the natural teeth, through which they drill holes, and attach to the teeth with copper wire. In Japan, dentistry is more of a science. Doctors and dentists there are nearly worshiped. In Yeddo I saw a man carve out of hard wood, like mahogany, a plate to fit the roof of the mouth, and in this he inserted human teeth. The work reflected great credit upon his ingenuity. The teeth of the Chinese are very superior. They are finer and more durable than ours. Their diet is cleansing in itself. The Japanese are a most cleanly people. They use tooth-brushes made of willow, cut like a tooth-pick. They do not fill teeth.

I have two students,—one I took to Berlin and one to Philadelphia. They make fine operators. The artificial teeth made by a goldsmith there you would be surprised to see. Caries is not very prevalent. They use very little confectionery or sugar.

Dr. Thomas asked how they could use enough arsenic to cause a tooth to drop out, without great danger of poisoning.

Dr. Eastlack said that he had never seen the operation performed; but in the napkin used he discovered pincers.

On motion of Dr. Rehwinkle, it was resolved to appoint a committee to memorialize Congress in regard to the appointment of dentists to the army and navy.

The subject of Dental Chemistry was taken up, and Dr. M. H. Webb read a paper on "Anæsthesia."

Dr. Atkinson objected to calling this a paper on Dental Chemistry. He thought it was, however, indicative of fresh thought. Privity of oxygen he claimed was the true cause of anæsthesia. He thought all anæsthesia was of Satan.

Dr. Buckingham excepted to Dr. Atkinson's views in regard to all anæsthesia being due to privity of oxygen, else hydrogen and other harmless gases which have no oxygen would produce anæsthesia, which they do not.

Dr. Summers claimed that nitrous oxide did not affect the blood-corpuscles, but acted directly on the periphery of the cerebro-spinal system of nerves. He spoke of the deleterious action of alkalies on the teeth by combination with the animal structure, thus preparing the way for the breaking down of the mineral substance. This was accomplished by osmosis.

Dr. Taft could not see that the introduction into the arterial system of alkalies would affect one part of the system more than another.

Dr. Rehwinkle thought if that were established, medical treatment would be a very simple thing.

Dr. Osmond called attention to "a vile compound called Sozodont," which was very deleterious to the teeth. He had also seen the worst effects produced from the use of soap. Softening around the gums will result if this is persisted in. He thought phosphate of soda of great benefit to the teeth.

Dr. Douglas brought up the case of a patient who suffered from recession of the gums on account of the use of iodide of potassium, prescribed by her physician.

Dr. Osmond said he had found nothing better than nitrate of silver for application to soft teeth. It turns them black, but it makes them as hard as flint. He applied it by putting it in a dish of paraffine, warming by a spirit-lamp, then applying by cotton.

Dr. Buckingham said the best way of applying nitrate of silver was by dipping a silver spatula in nitric acid, thus forming on the surface fresh nitrate of silver.

Dr. Douglas said that after applying the nitrate of silver and letting it stay a sufficient length of time, he applied common salt solution, which converted the excess into chloride of silver, thus preventing discoloration.

Dr. Hitchcock. I do not care about discussing the subject of the relative effect of alkalies on the teeth. That has been settled long ago by Rottenstein, Wedl and others. No one disputes the fact that alkalies do affect the dentine if the enamel is removed. When it is covered with enamel it does not destroy it. Something has been said about soap being detrimental to the teeth. It makes a great difference what kind of soap you use. In my own mouth I have used as a dentifrice good Castile soap, which is the purest form of soap, for twelve or thirteen years.

I have used nitrate of silver with good effect where a cavity is threatening to form—not where it is already formed. Place the nitrate of silver on a piece of paper, and apply with a little stick, and then rinse the mouth. Chloride of zinc will answer nearly the same purpose. Again, ladies frequently come to me with soft, sensitive teeth, and by applying litmus paper to the region around Steno's duct it becomes reddened, denoting an acid saliva. When you attempt to excavate, it is exceedingly painful in these cases. Now, my plan of treatment is to prescribe bicarbonate of soda, a teaspoonful three or four times a day, before or after meals. I give this for ten days or two weeks, and the operation of filling can go on; insert Hill's stopping, and after that undertake to repair the damage done by the caries.

Dr. Stellwagen said that he did not believe that alkalies had any deleterious effect upon the teeth. He fully understood the osmotic action referred to, an example of which was seen in the immediate effect produced upon the teeth by the introduction of acid or acrid substances in the mouth. He did not believe, however, that alkalies were injurious. He referred to what had been said by him in Nashville on this point, with regard to experiments made on his own children by rubbing chalk around the teeth and putting lime-water in their milk, thus insuring hard, healthy teeth.

Dr. Taft. I would like to ask Dr. Hitchcock what is the action of the nitrate of silver?

Dr. Hitchcock. I presume it unites with the animal substance.

Dr. Taft. My object in asking was to ascertain whether it is necessary to use nitrate of silver. It is the nitric acid that unites with the calcium oxide, leaving the silver oxide on the surface. The nitric acid by itself will accomplish all that is desired. Discoloration of dentine does not follow from its use, and you can dilute it just as you want.

Dr. Palmer. Why won't mercury do as well as nitrate of silver?

Dr. Osmond. I have tried nitric acid, and find that it produces sensitiveness. In the action of nitrate of silver, it is the silver oxide that unites with the albumen.

Dr. Whitney, of the Sandwich Islands, being called upon, said: During the four or five years I was on these islands, I gathered some facts which seem to bear on the point at issue in the beginning of this discussion. Formerly all burials were made in caves, so that 10,000 skeletons to-day may be found in these caves. An accurate history kept by the people enabled me to determine exactly when fruits and acids were imported into the islands. I thought, now can I, knowing these things, determine anything definitely in regard to the effects of acids on the teeth? I went through the caves and examined the teeth of the oldest skeletons, before fruits were brought on the island, and I found that though not perfect they were not by one-half per cent. so much decayed as those of later times. So marked was the difference that I could mark the time when fruits were introduced by the teeth of the skeletons. In those fed on fruits there was one in fifty decayed; in the older, one in one hundred.

Prof. Taft asked Dr. Osmond if there was any menstruum that would dissolve silver oxide.

Dr. Osmond. It unites with the albumen as soon as it is set free.

Dr. Forbes mentioned cases where he had filled two-thirds around the margin and preserved the teeth. For teeth sensitive around the margin, he dipped a stick in dilute alcohol and then in pure chalk, and applied with a beneficial effect.

Dr. Douglas spoke against the administration of alkalies as medicine, and also acids. He had seen fine sets of teeth ruined by the use of sour drops.

The subject of Operative Dentistry was taken up, and Dr. Hitchcock presented some models on which he explained a case of irregularity corrected by torsion. He spoke of the great extent to which torsion is resorted to in England. They will sometimes turn a tooth half way at one sitting, and then at another to its proper position. He quoted Tomes and others on this point.

The association then adjourned.

Evening Session.

The association met for the election of officers and selection of place for next meeting, with the following result:

President.—Dr. T. L. Buckingham, of Philadelphia, Pa.

1*st Vice-President.*—Dr. I. Forbes, of St. Louis, Mo.

2*d Vice-President.*—Dr. A. F. McLain, of New Orleans, La.

Corresponding Secretary.—Dr. J. Taft, of Cincinnati, Ohio.

Recording Secretary.—Dr. M. S. Dean, of Chicago, Ill.

Treasurer.—Dr. W. H. Goddard, of Louisville, Ky.

Executive Committee.—Drs. G. L. Field and G. R. Thomas, of Detroit, Mich.; G. H. Cushing, of Chicago, Ill.

Place of meeting, Detroit, Mich.

Fourth Day—*Morning Session.*

The subject of Operative Dentistry was resumed.

Prof. Judd. I rise to call attention to the notched condition of teeth. I have never heard it discussed. It has never even been brought up, so far as I know. Hutchinson, in his book, regards it as a pathognomic sign of hereditary syphilis. It is a vertical notch in the cutting edge of the tooth,—not pits, as in atrophy. I would like to hear an explanation of this.

Dr. Hitchcock. It is very difficult for persons in regular practice to determine, having the care of the teeth alone, what the parents were,—whether they, as the saying goes, had sowed wild oats or not. It is seldom that we know anything in regard to this. The observation referred to was first stated by Hutchinson, and published in the Journal of the Ophthalmic Association. His specialty was the eye. He noticed interstitial cavities coming on at twelve or fourteen years of age, which all agree to be the result of syphilis. He also observed the notched appearance of the teeth, and a more thorough examination confirmed his suspicion. Other ophthalmic surgeons say the same thing. What are the causes of this? Some observers consider it due to stomatitis occurring when the edge is forming. It then breaks out and leaves a lunated margin. A case was told me of a nice-looking gentleman who brought his daughter to the dentist, who exhibited such surprise on looking into the mouth that the father apprehended at once his suspicions, and took his daughter out of the chair. Another case: A young lady coming to the dentist, his suspicions were aroused, and he asked the mother if she had ever had any eruption. She told the story, and the father notified the dentist that he had better not make such minute inquiries.

Dr. Stellwagen. I took the wards of the Philadelphia Hospital,—one of the largest eleemosynary institutions in the land,—and examined the mouths of the children there, with the view of satisfying myself on this point. The results were not confirmatory of Hutchinson's observations. I was so little encouraged by my examination, that I have not paid much attention to it since. Negative results, of course, do not prove that the observation is without foundation. But I will state that I think I saw numbers whose parents were tainted.

Dr. Hitchcock. Had the parents had inflammation of the mouth? I think it is not claimed that every person who has had syphilis develops this notched condition in the teeth, but that when it occurs it is referable to syphilitic taint.

Prof. Judd. Mr. Hutchinson was employed in treating almost entirely hereditary disease. He has not made many observations on healthy patients. Now can *we* find this notched condition where there is no hereditary taint? This is what we want to know, I think. If our attention is directed to it, we may determine this. If we can find one case of the sort, we can state positively that it is not a pathognomic sign. Hutchinson does not think it will apply to deciduous teeth.

Dr. Stellwagen. It is almost impossible to satisfy ourselves that there is no hereditary taint. I know some most sad cases of contamination of infants carried by nurses to places where it is imparted to them by contact. The children are forever tainted.

Prof. Taft raised a point of order, that this was not the subject under discussion.

Dr. Herriott. Some have experienced trouble in the use of the burring engine, on account of the wearing out of the burs. I have heard it surmised that they lose their temper on account of the heat developed in turning. I was surprised to know that a man would use a bur in such a way as to develop heat enough to destroy its temper. It is a great mistake to apply the bur and hold it while filling, making retaining points, or dressing, until it gets hot. It should be put on, then taken off alternately, not allowing it to stay long enough to get hot.

Dr. Carroll. The little burs are either lacking in temper or the quality of steel is not good, for after the second or third time they are almost useless. I can't think it is the rapid revolution, for I could use the old finger-burs a month, and I could impart great velocity to them.

Dr. McDonneld. I have met with difficulty on this point myself, and I am satisfied it is due to the velocity with which they are turned. They should be kept surrounded with moisture. I have come to the conclusion that it is heat which causes the trouble. A small wire would lose its temper where a large one would not. I have adopted Smith's little drop-bottle to keep the surface wet.

Dr. Morgan. Did the bur ever change color?

Dr. McDonneld. No.

Prof. Eames. I noticed in an English journal that they had met with the same difficulty in London. They had made arrangements for overcoming it by having a tank with a flexible tube attached, so as to conduct water to the bur, and the flow was regulated by a thumbscrew.

Prof. Taft. The common rubber-ball syringe will answer for this purpose. I want to call attention to the cleansing and polishing of teeth. We frequently come across deposits on teeth, as green stains in the mouths of young persons, especially on the anterior surface of the superior teeth; also roughness and abrasion of the surface. The ordinary method involves a great deal of labor. I have been using Dr. Baxter's (of Indiana) little cones of Arkansas stone. I apply them with Morrison's engine, and they clear away all the roughness and polish the tooth completely. Nothing else is required, and they give a polish nearly as perfect as the natural enamel; makes them of various forms. I have some here, which you can examine.

Dr. Herriott. I think the dentists will find no trouble in regard to the heating of burs if they use the hot-air cavity dryer. Morrison's engine is a fine thing, but we need one by which we could obtain a better control of our bodies. The discs furnished us are also very frail, and great care is needed in using them, both for burs and teeth.

Dr. Knapp. It was suggested at Niagara that sensitive dentine had better be operated on when dry. I apply the rubber dam to remove the loose material. All agents are more effective when the cavity is dry. You need not operate so rapidly as to heat the bur, but you had better not wet the cavity. A young lady came into my office some time since, crying, in dread of the operation. I applied the rubber dam, removed the loose material, then applied carbolic acid. It was a little painful at first, but she got through very comfortably, in view of what she expected. You had better pay for more burs, than to use water in the cavity.

The president then announced that there was a medal in the hands of the association, for presentation to Dr. Barnum, from the California State Dental Association.

Dr. Knowles being appointed to present it, came forward and said:

Mr. President and gentlemen: I expected to find a letter accompanying this, but it is not here. It seems in the divine order and fitness of things that it is eminently proper that I, as the representative of the State from which this comes, should be selected to present it. The history of it might not be altogether uninteresting to you. It grew out of a discussion arising from the rubber question, and the comparison of the relative merits of the articles presented for our use. The discussion finally drifted into the consideration of the attitude which the Rubber Company sustained to the profession as compared with that of Dr. Barnum. In the enthusiasm which arose, the question suggested itself, What can we do to express our appreciation of Dr. Barnum's service and liberality to our profession? On this there was a difference of opinion. I, for one, being decidedly of a practical turn of mind, was for presenting him with five hundred dollars in coin. But it was naturally supposed that he would soon spend this, and there would be an end of it. Hence it was resolved to give him something that he could not dispose of for its intrinsic value. A committee was appointed in 1872 to take the subject under consideration. This was composed of Dr. Dennis, to whom you (turning to Dr. Barnum) are more indebted than any one else for this expression of appreciation, and Dr. Dutch. I take great pleasure in presenting you with this testimonial as an appreciation of your service and liberality. You will please accept it, therefore, and I am sorry that I have not fitting language to employ in its delivery.

Dr. Barnum. This is indeed a beautiful testimonial. God knows I am truly grateful for your kind appreciation. I like it, not for its intrinsic value, but because it tells me that my little effort has been appreciated. I would that I had words to express myself. Gentlemen, you have all treated me kindly, and I thank you. If I could do more, I would cheerfully do it. I have never regretted freely giving to the profession what I might have made lucrative to myself. I don't ask for money,—that I can work for,—but this I look on with great satisfaction. I would like to return my thanks in the form of a letter, where I can write in chosen words. I again thank you all.

The discussion was then resumed.

Dr. Morgan said that twenty-two or twenty-three years ago Dr. Hamlin and he used the stones for polishing. By calcining and reducing them to a powder, they imparted a fine polish.

Dr. Forbes asked Dr. Knapp if the operation of putting on the dam did not relieve the sensitiveness itself.

Dr. Knapp. I think not.

Dr. Chupein. I have had a case in which it was impossible to touch the dentine, when, by applying the dam, I excavated without difficulty and with but little pain.

Dr. Carroll. I fill no tooth without the dam; it facilitates all operations.

Dr. McDonneld. I have been using it for some years with success. But previous experience has taught me that I can fill many cavities, where the dentine is not sensitive, without resorting to it. It is the height of folly to torture any one for nothing. In simple cavities I would think its application smacks of the inquisition.

Prof. Judd. In relation to placing on the rubber dam, three or four years ago I experienced the common difficulty of holding it down after it was stretched. We constructed a clamp, very much like that known as the Allen clamp, made round instead of flat. But this frequently broke. The Allen clamp answers admirably; you can place the dam on in a quarter of a minute without difficulty. I believe you can do it in every instance, and that with one-tenth the trouble. In this way I consider it second only in value to the dam itself.

Dr. Taft. I saw the first development of this in New York two years ago or more. It was made by Dr. Delos Palmer. He has a better clamp than the Allen. There are cases in which annealed copper wire can be used with benefit, where the tooth is so conical that the clamp would slip.

Subject passed.

The president elect, Dr. Buckingham, took the chair, but declined making an inaugural, as time was precious.

Dr. Stellwagen called attention to the use of gold-beaters' skin in laying over exposed pulps. He stated further that with keen instruments the most sensitive dentine could be excavated with comparatively little pain. He used Dr. Palmer's fine instruments, and he did not believe, before trying them, that it was possible to get instruments with so keen an edge.

The subject of Mechanical Dentistry was taken up, and a paper was read by Prof. Eames.

Dr. Honsinger presented a diagram, and recommended some change in the mode of applying the pins to artificial teeth.

The subject was passed without further discussion.

The subject of Dental Education was taken up.

Dr. Morgan, chairman of the committee, said that accident and ill health had prevented him from preparing a report.

A paper was read by Dr. E. J. Waye, dealing largely with the establishment of dental laws.

Dr. Herriott. I recognize the good that might be done by the measures proposed, if it were possible to bring the dentists under the proper legislation. Out of four hundred and six dentists in our State, less than one-half have diplomas or certificates from the board of examiners. If any attempt at legislation of the kind proposed were made, these men would go to the legislature and plead that we were imposing on them.

The subject was passed, and Dr. Palmer invited to the floor.

He prefaced his remarks by stating that he was not an instrument-maker, but only working for the good of the profession. He exhibited a case of his instruments, consisting of thirty-five pieces and costing one hundred and six dollars and twenty-five cents. He dwelt upon the difficulty of getting workmen to bring out fine instruments. Mr. White could not control it, for they *will not* work on them. He recommended dipping the fine instruments in carbolic acid for excavating sensitive dentine.

The association then adjourned.

Afternoon Session.

A committee of seven was ordered to take such measures as they may see fit to protect the interest of the dental profession, and continue the work of the committee appointed last year.

The subject of Dental Literature was taken up, and a paper sent by Dr. Bogue was read. The paper severely criticised the journals in existence, so far as their connection with mercantile interests was concerned. He stated that the *Missouri Dental Journal* was the only one that was not so connected. The paper also animadverted upon the action of the Canada Board of Examiners in regard to the dental colleges of Philadelphia. He reviewed also the books that had come out before the profession.

Dr. Morgan. I have read the recent work of Dr. Arthur. I regard him as an unreliable observer, because he proposes to do things that no man can do. He claims that he can look at a tooth and tell whether or not it is going to decay. This no man can do. The plates also are objectionable. There is not a single one that represents a first-class operation. They all represent fourth or fifth-class operations; one plate perhaps gets up to a third-class. He also advises that certain persons should have their teeth examined once a month. In this way you have a large practice; would have patients coming in every day to your office interrupting your operations. Again, his definitions are vague and unsatisfactory. For instance, he defines the enamel to be a smooth polished covering. The work is a contradiction from beginning to end.

Dr. Atkinson. We are not sufficiently advanced to pronounce so dogmatically as has been done in that paper. It seems to be a benevolent effort to make Tom, Dick, and Harry know how in the shortest time to do the most mischief. The appliances referred to in the book of Dr. Arthur are unfit for use; all the large discs that are thin enough require the mouth to be opened too wide. There is not a single one but what is mischievous; his own are execrable. It has been claimed here that the Arkansas stones can reach all parts of the tooth. I apprehend that no stiff body can adapt itself to the surface at all points. Corundums are better than files. I haven't had a file yet that was of any account unless I made it myself.

Dr. Thomas. Amid the general and wide-spread diffusion of dental science, the time has arrived when manufacturing ability is so perfect that we need to turn our attention more particularly to the prevention of disease. I have been in the profession twelve years, and within that time I can remember when there was no admission to a dentist's laboratory. If a patient asked to go in, he was answered that there were things there to be known only by the dentist. The time has now arrived to direct the public mind to something better than manipulative skill. Patients come into our offices expecting only to receive manipulative skill, and never think of consultation as to the best manner of preventing disease. Some time ago a committee was raised to solicit articles for distribution among the public, and to produce terse articles for the school-readers upon the care of teeth, proper diet, etc. It seems to me that every patient ought to prize the valuable time we spend in explaining these points to them in the office high enough to pay for it. How many of us get actual fees for such advice? We must make the patients feel that it is valuable; we must guide them in regard to the prevention of disease. If we do this, the demand for manipulative skill will decrease. Let us look into this: I can remember when, a few years ago, I could not see the bearing of many things discussed at these associations; but I began to appreciate their value as my sphere of thought enlarged. We should have pamphlets published; better without any name. Let them be worthy, and I think they will be generally appreciated and acted upon.

Dr. Hitchcock exhibited his edition of Wedl, and said, in reference to the journals, that if the profession had journals that were not published in the interest of mercantile pursuits, so that they could take an unbiased opinion on any subject, they would have things different. He did not believe that State laws would do any good. The profession should be educated first, and then the distinction would soon be made. This cannot be done by one course at college. Formerly it may have been a wise measure to permit parties to graduate in one course after they had been some time in practice. Now things have changed. He had found that where there was one worthy of a diploma there were a dozen unworthy. He could not talk without being tinctured with the views of Harvard, with which school he was connected, but he believed its course the correct one. They had started off with a five years' course, exclusive of practice. If the colleges would take the proper stand, the dental literature would be better sustained. He took the *Missouri Journal*, and was pleased with its independence.

Dr. Wright preferred terse articles in the papers to pamphlets for distribution. He referred to the plan which he stated to have originated with the *Missouri Dental Journal*, of publishing the biography and giving the likeness of dentists of eminence. He thought it a good one.

Dr. Stellwagen. I am pleased to see every day an advancement in the profession. I am pleased to see that we are not so far behind as some would have us think. All the journals, gentlemen, contain very valuable matter. I fear you are too easily dissatisfied both with your colleges and your journals. But let me tell you, crimination and recrimination do no good. Let each one determine to do all in his power to promote the interests of his profession. It will be years and years before we can talk of educating the public. We must educate ourselves,—bring ourselves up to a standard of respect among our brethren of the medical profession. In Philadelphia there is no trouble on this ground. The day is past there when dentists are considered upon a lower plane. *There*, there is no distinction between dentists and medical men. I have seen the highest respect shown to dentists by the very first medical men in the country. They place their wives and children in the hands of the dentist, and meet them on a level or not at all.

But the time has not yet come for uniting the two professions into one. Until dentists are put in a proper light before the medical profession, we had better have separate journals and separate schools. But the day will come, and I hope to see it soon, when every man will be required to show his medical diploma before he is allowed to matriculate. I am waiting patiently, but I am sure it must come.

I wish now to answer a remark in regard to the action of the Canada Board, referred to in the paper just read. I fear it has been too hasty in its action. They accuse the Philadelphia Dental College and the Pennsylvania Dental College of repeatedly violating their published requisitions. On consultation with Prof. Buckingham, we find that three men only have been received from Canada, two of whom are living, and they are certainly worthy men. No man can pass through our college unless he is well qualified to do so. Out of the fifty-nine who presented themselves for graduation last term, one was told that he could not pass on account of his having been addicted to bacchanalian revelings. Of the rest that were refused, there was one from England, one from Brussels, and one from Virginia. We have always endeavored to elevate the profession. We don't ask for students unless they are of the right kind. At our last college commencement party I was repeatedly taken by the hand and congratulated upon the material on which we had to work. Men would say, "Stellwagen, where did you get such men? The profession cannot help advancing with such an elegant set of men coming on." Even down to the servants who waited on them at my house, they were appreciated for their orderly demeanor and gentlemanly bearing. After an entertainment which had been given them, my wife remarked that she had never seen gentlemen behave themselves with so much propriety, and, what is very unusual at such gatherings, not a thing was broken.

The dental colleges, gentlemen, have done what no other colleges have done. One-fourth of their patronage is from Europe. I defy you to show where any medical college has done this.

In conclusion, let me say that, so far as we know, the charges brought against our school by the Canada Board are wrong. I have a letter written in reply to these charges, a copy of which was sent them, and I would like to have this read.

By permission the letter was read.

Prof. Taft. I never imagined that this subject was so elastic as to be converted into special pleading. Our discussions should not take this course, nor should they, on the other hand, enter into condemnation of enterprises in the manner which has characterized the present discussion. While it is well worth while to examine our literature as to its ability, it does not seem proper to enter into such a tirade of condemnation. It is very easy to criticise, and, of course, they fall very far below what we would have them to be; but have they the proper support of the profession? As to the articles contained in the journals, one may be of very great value to one man, though not to another. Let us bid them God-speed. Because all the articles are not of the highest order, it does not follow that they will not be of service to anybody. In regard to publishing biographies, the *American Journal* began that years ago. It is by no means a new thing. In reference to the subsidizing of the journals to commercial interests, this must be taken with a few grains of allowance. I insist upon it that this wholesale denunciation is out of place. Let us walk shoulder to shoulder, man to man. All the journals are doing all they can. The DENTAL COSMOS is a very valuable journal. The *Dental Register* is doing all in its power to advance the interests of the profession. It is true they are published by men who sell dental goods; but that has nothing to do with the articles which appear in them. I do not think our journals should be throttled in this matter. In regard to Dr. Arthur's work, I think Dr. Morgan's criticism a just one, and also Dr. Atkinson's. In regard to the doctrines taught, I think that, so far as practice is predicated on these principles, it will be wrong. Books should be very careful in what they say, as they are to go before students.

Dr. Herrick thought the journals were not supported by the profession as they ought to be. He said that he had recommended the employment of a reporter by all the societies, and sending the proceedings to the journals. It would be of great benefit to those who could not attend.

Prof. Taft said that it was an up-and-down business with a poor editor. At one time a man would come in and say, "What in the world did you publish such an article for?" And just after, another would come to thank him for it, and say it was the best thing he had ever seen.

Prof. Judd said that he had nothing to say, one way or the other, on the question, but would simply remark that he regarded this discussion as an outcrop of public opinion. The same thing had occurred in medical circles twenty years ago, and it wrought a good influence on medical literature. He had tried to find something in the medical journals to criticise, but had failed. It was not so with the dental journals. He did not believe they could have a first-class literature until it was perfectly independent. It is not so much so now as the literature of the medical profession.

Dr. Wright said he had no disposition to go back on the *Register*,—he couldn't do without it.

The subject was then passed.

The subject of Etiology was taken up, and Dr. Cushing read a paper on the "Etiology of Caries."

Prof. Judd. Any theory of caries that does not give attention to parasitic growth is worthless. It is an interesting study to find out what is fatal to these growths. There are a good many agents which instantly destroy the common forms, as those of stagnant water. Alkaline solutions destroy them at once. A great deal might be accomplished by a proper investigation on this point. That green stain is of parasitic origin, I have no doubt. Carbolic acid seems to exert a very deleterious influence on these growths, and when applied to children's teeth, covered with various kinds of deposits, it restores them to a healthy condition, and I have no doubt acts by destroying parasitic growth.

The subject was passed without further discussion.

The Committee on Prize Essays was called; but there was no report.

The Committee on Local Societies was called, and Dr. Judd said that Dr. Palmer, of Syracuse, had prepared a report, and had been expected to attend the meeting; but not having done so, he asked further time, which was granted. He had attended the Illinois State Association, and had done all he could to enlighten them.

Prof. Taft said that he had visited some twenty-four societies during the last year. He was glad to see them working so harmoniously, and he reported a great progress in almost every interest He thought these visits should be kept up,—they stimulated the local societies to work. Some of them so appreciated them as to pay Dr. Palmer's expenses to come among them to operate for their instruction. Dr. Atkinson, he said, was doing a great work in this direction. The pleasure that it gave the societies to receive their visiting brethren fully repaid them for going.

Dr. Atkinson said: My intercourse among the various societies has been very pleasant, especially in the South. There they fight and quarrel, and say I'm wrong, and all that; but when I convict them they are convicted all over. They are honest, and when they give up it's all over, and they go to work on what they have learned; but these New England fellows are hard to convict. They think they are the hub, you know, and when you show them the truth they say, "that's so," and all that, but they are only convicted on the surface. If you go back to them after awhile, you'll find them sunk right in the old ruts again. Dentistry is moving on. Men are getting clear, and I hold that we, to-day, are the highest representatives of scientific progress on earth.

The following committees were appointed for the ensuing year:

Physiology.—M. S. Dean, E. A. Bogue, A. W. Harlan.

Pathology and Surgery.—H. Judd, H. S. Chase, C. C. Knowles.

Histology and Microscopy.—T. B. Hitchcock, C. E. Latimer, J. Taft.

Chemistry.—H. A. Smith, C. R. Butler, W. T. Wallace.

Therapeutics.—T. C. Stellwagen, L. Jack, J. McManus.
Operative Dentistry.—L. D. Shepard, G. C. Daboll, G. L. Fields.
Mechanical Dentistry.—S. B. Brown, J. F. Canine, E. D. Swain.
Education.—A. F. McLain, G. W. Keeley, E. J. Waye.
Literature.—W. H. Eames, C. Buffett, P. G. C. Hunt.
Etiology.—J. H. McQuillen, M. H. Webb, J. Johnson.
Prize Essays.—W. H. Goddard, J. Forbes, G. F. S. Wright.

Drs. Keeley, Wright, and Crouse were appointed a committee to raise $1000 for Dr. Barnum.

The association then adjourned, to meet at Detroit the first Tuesday in August, 1874.

AMERICAN DENTAL CONVENTION.

(Continued from page 540.)

THIRD DAY—*Morning Session.*

OPENED with the discussion of Salivary Calculus and its Removal.

Dr. Atkinson said that salivary calculus was never the CAUSE, but the *occasion*, of the recession of the gums and wasting of the alveolar processes. First, the dental ligament gives way in consequence of mechanical or diseased action, forming a small pocket or recession, in which the solution of lime-salts deposits and consolidates, in connection with particles of other foreign matter that may be entangled in the crust. Loss of tone in the duplicature of the mucous membrane, which forms the edge of the gum, permits it to hang off from the neck, forming a channel in which the deposit occurs. The debility present causes the death of connective tissue corpuscles that constitute the outer layer of the ligament; which process successively wastes the ligament and induces the deposit whenever there is an abundance of lime-salts in the saliva.

Dr. Ambler had met with formidable diseases created by deposits of salivary calculus. An aggravated case was presented in the mouth of a well-connected lady patient of his, whose personal appearance indicated perfect cleanliness; her general health was apparently good; she said that she had never had a sick day in her life. He found her mouth in a very offensive state, the width of the deposit being two-thirds the length of the incisor teeth. She was unable to touch her gums, the whole surface being inflamed. There was a flow of fetid saliva and offensive discharges. He treated by removing the tartar and giving astringent washes.

Dr. Wetherbee said that, from an experience of twenty-seven or twenty-eight years, with regard to salivary calculus, he was obliged to take issue with the statement of Dr. Atkinson with reference to its effect upon the recession of the gums. In many cases we find the two inferior central incisors followed up by deposits of tartar; whilst the two lateral incisors are scarcely affected at all—only a slight deposit upon the lingual surfaces. Salivary calculus is first deposited under the free margin of the gums; is increased and forced against the gum and attached to the cementum. Irritation of the membrane is the pathological effect, and as a result it succumbs. The deposit goes on; by irritation the attachment is destroyed. It still increases up under the gums until it becomes and is the OCCASION, the *cause*, the persistent cause of the recession of the gums. The inflammation existing in the gums extends to the pericementum, causing the absorption and recession of the alveolar processes. He mentioned an aggravated case,—the discharges from the mouth staining the pillows at night,—cured by simply removing the tartar.

Dr. Skinner mentioned the case of a young man whose teeth were good, with the exception of the two lower central incisors, which became loose on account of the recession of the gums and absorption of the alveolar processes, without the presence of tartar.

Dr. Wetherbee said that the recession of the gums is not always owing to the presence of salivary calculus. Excessive alkalinity of the mucous secretions and viscidity cause recession.

Drs. Dudley and Atkinson denied the alkalinity of the mucous membrane.

Dr. Bonwill had found that the greatest amount of tartar was occasioned by the consumption of starchy food, and neglect of cleaning the teeth. The deposit hardens in the saliva in a short time. The alluvial deposits in the beds of streams, where there is ebb and flow, illustrate clearly the case. The twice-daily deposit finally reaches a point where there is vegetable growth and high land. So with starchy food. It collects very rapidly from the nucleus and layer, and deposits are formed from this. He did not deny that it was deposited from the saliva, glands, etc.

Dr. Perkins said that for several years he suffered with dyspepsia and a low tone of health, and during that time there was never the slightest accumulation of tartar on his teeth; and now being in good health, he was obliged to remove it frequently.

Dr. Judd, of St. Louis, said that the first cause was inflammation, which, loosening the margins of the gums, caused the deposits to take place. There were other kinds of accumulation, differing from deposits of masses: fine grains only are sometimes deposited upon the fangs of the teeth, up under the margin of the gums, the gums not receding. The alveolar processes are destroyed, while surrounding soft tissues remain intact and healthy to all appearance; there being no pus or discharge of any kind. He treats it with chloride of zinc in a paste, carried up under the gums ; has also used nitrate of silver, but found by treating one side of a tooth with the former and the other side with the latter, that after ten days' treatment that treated with chloride of zinc presented the best appearance. This kind of tartar is supposed by some to be the secretions from the soft tissues surrounding the apex of the root, but he believed it to be a deposit from the saliva.

Dr. Atkinson. Prof. Judd asserts that granules are deposited from the saliva. The source of the lime in the saliva is the same as the source of the lime in the circulation. Lime must be first in the blood plasm ; then it can be deposited in any pocket, or excreted through salivary ducts with the saliva. When deposited at the end of the root, without communication with the saliva, the broken-down red corpuscles afford coloring matter sufficient to form what is called dark-brown or black nodules. Around this first deposit successive accretions constitute the nodules that bestud the end of the root. Where recession of the gum occurs other than by traumatic and pathological processes, it results from the exhaustion of the seed bodies of the tissues, preventing reproduction of the connective tissues that form the dental ligament and the free margin of the gums. This is an hereditary condition, transmitted through primogeniture, the same as weak lungs and other organs, and the premature blanching of the hair,—these all being examples of hereditary influence, depending upon the confluence of different endowments of longevity in the parent stock. All secretions of acinus or grape glands are alkaline, but the secretions from the mucous follicles are really acid. The admixture of these in the mouth renders it difficult to determine the character of the saliva as a whole.

Dr. Eastlack, of Shanghai, China, on invitation, addressed the convention on the status of dentistry in that country and Japan, and gave an interesting account of the various tricks practiced by the native dentists upon their credulous patients. They profess to extract worms from aching teeth, and thus destroy the pain. By close observation he discovered that they had maggots crowded in a piece of bamboo, and when applied to the tooth one would fall out, leading the sufferer to suppose that it came from the tooth. They also apply a powder, which he found to be arsenic, around the neck of the tooth they wish to extract; this causes the tooth in a few days to loosen and drop out. The Orientals carefully clean their teeth. In answer to a question by Dr. Allen, he said they used bolted flour. Wheat is raised, though inferior to our own. Rice is also used in large quantities.

Dr. Palmer exhibited to the convention his beautiful set of instruments. He called attention to a plugger intended for use in posterior cavities of molar teeth, with the mallet, by means of which the force can be carried forward and the gold built up with ease and beauty.

OXYCHLORIDE AND ITS USES.

Dr. Atkinson complimented the convention, and the author of the paper on this subject, upon the ability displayed in its preparation and the research evinced in its production. He had never seen, nor did he believe any other man had seen, a pulp destroyed by the application of creasote or carbolic acid. We must have the skin or its substitute to have the pulp heal at all, in case of exposure. The natural protoplasm coagulated is the most kindly pellicle we can get, and form a scab; from this the best result we can get is the deposition of secondary dentine. Use creasote, then cream of the oxide of zinc mixed with water (which forms the hydrated oxide of zinc, which has no affinity for any of the elements of the tissues which lay against the mass, so that it would not deprive it of its water of crystallization). When it begins to set, bring oxychloride of zinc in a creamy paste, fill up, and we won't have any dead pulps nor any trouble. He filled pulp cavities and canals with cotton saturated in oxychloride of zinc.

Dr. Wetherbee differed from Dr. Atkinson as to the manner of filling pulp cavities. He contended that where cotton could be carried he was also able to carry gold.

Dr. Mills has used oxychloride of zinc in filling roots. He believed that thousands of roots filled with cotton and creasote are doing well, although he only believed it to be the best filling in certain cases.

Dr. Judd did not think cotton and creasote to be the best for filling roots. He had taken out cotton and found it foul. He described his method of preparing gold for filling canals. He cuts soft foil in pieces, one-half inch square, and rolls them in the form of a cone. The apex of the root is small in all healthy teeth, and the surface of the canal is very smooth, so that a slight movement will carry each one towards the point where it can be consolidated with little pressure.

Dr. Bonwill called attention to the finest zephyr as a substitute for cotton for compacting in canals; has used it more successfully than gold, and believed it to be the most analogous thing to gold we can get. Puts the purest wool over exposed pulps, and fills over with oxychloride.

Dr. Dudley did not object to the formation of a pellicle, although the less pellicle you had to answer the purpose of nature the better. He objected to the use of carbolic acid, as being too much of an irritant; objected to oxychloride of zinc in filling roots. Sufficient force cannot be put to impact the cotton properly. Gold, by skillful operators (with the right instruments), is the proper material, since it can be carried more perfectly to the apex of the root.

Dr. Drake would not say whether one material was better than another. Good results depend upon the skill of the operator. If one operator can use cotton and creasote with the best results, let him use it. There is no substance worse than gold, if the operation is not properly done. He had removed six or eight teeth with alveolar abscess, the roots of which were filled with gold.

Dr. Palmer said that he had produced nerve instruments that the work might be properly done. The gold should be carried to the apex of the root, and condensed solidly. Roll the gold in cone-shape, turn it over, and form a loop. Heat it,—but do not crisp it; dip in carbolic acid, and carry it with pressure to the exact point; bring the mallet to bear, and condense. The balance of the root it would be better to fill with Guillois's cement, since it helps to make the root semi-transparent.

Dr. Coy noticed the failure to make a distinction between teeth where the pulps have been recently destroyed and extirpated, and those in which the pulps have been dead for a long time. In the case of the latter kind, the walls of the canals would be found to be impregnated with gases. No treatment would prevent the smell coming back again. The best that can be done is to drill away as much as possible of the dentine, then infuse carbolic acid throughout the canal, and finish in the manner described by Dr. Palmer.

Dr. Gage thought that every man should judge according to his own ability how to fill and when to fill. Ten years ago he filled all nerve canals with gold. He filled a superior bicuspid with gold, and lockjaw set in. Since then he almost hesitates to fill with gold; has filled with cotton and creasote, oxychloride, and with wool.

ANÆSTHESIA.

Dr. Drake said that he dreaded nothing so much as the administration of anæsthetics. He had carried his patients as near death's door as he cared to, and never takes up the sponge without a nervous feeling which makes him dread its administration.

Dr. Fuller had used nitrous oxide for seven years, and in that time had given it five or six thousand times. Whenever a patient wished to take it, he gave it. He has had better results with intelligent persons than with the uneducated.

Dr. Tefft, of San Domingo, West Indies, advocated local anæsthesia. He used equal parts of chloroform, aconite, and alcohol. He places this mixture on the gums each side of the tooth; then cuts around it and extracts.

Dr. Skinner first commenced with ether; used it for three or four years, and then gave it up on account of its disagreeable effects. He then used nitrous oxide gas, and has never found the same deleterious or unpleasant effects. He gives it from the bag, but uses it as little as possible. He had used the compound of Dr. Tefft with good results.

At the morning clinic, Dr. J. E. Fisk, of Salem, Mass., exhibited his Saliva Ejector, which draws the saliva from the mouth through a small mouth-piece and rubber tubing by means of a vacuum produced by running water. He also read a paper before the convention on "Friction and Vacuum."

Dr. Bonwill also gave a clinic, demonstrating the value of his Electro-Magnetic Mallet.

Evening Session.

Dr. Reynolds had used nitrous oxide gas since 1865, and averaged five patients a day. He never refused to give it to any patient. He used the condensed nitrous oxide made in New York by Mr. Gladstone. He had taken nearly one hundred gallons, by breathing it until nearly unconscious, then waiting five minutes and breathing again; and so on until the whole was used without any ill effects whatever.

Dr. Palmer deprecated the use of an agent which gave license to the wholesale destruction of teeth, and thought it wrong to persist in using it.

Dr. Knowles thought even if anæsthesia is occasionally attended with some risks, we owe it to ourselves and to our patients not to shirk our duty in the matter. There are thousands of patients who suffer pain for years, and have their constitutions permanently injured through dread of having their teeth extracted, when by the administration of gas they could be relieved from all their sufferings and restored to health.

Dr. Atkinson classified all anæsthetics under one head, and opposed the use of all of them. The testimony given by patients who have just come out of an anæsthetic state is unreliable. They are in a state of intoxication, and will sign their names to anything, and testify to anything. The fact that there is no apparent injury at the time of their leaving the office is no proof that they have not suffered serious damage to their health.

Dr. Goldey said that he had given nitrous oxide continuously for twelve years. Many patients are willing to take it at any time, even to have their ears pierced. He had hesitated to give it in three or four instances only, where the patients were under treatment by their physicians, who would not advise its administration. He makes his gas in a galvanized gasometer, and thinks it improves with age.

Dr. Rich. Is pure gas, properly given, injurious to the system?

Dr. Reynolds. No more injurious than liquor; there is no more danger in taking it than in going to New York in the steam cars. If, in his judgment, there was any risk in giving it to a delicate patient, he would not give it.

Dr. Ambler wished to state to those living outside of New York city, that to his own knowledge there had been many patients seriously injured by the gas itself; could mention the names of at least fifty who have admitted having received temporary injury.

Dr. Goldey gave an account of a lady who became insane immediately after having had about twenty teeth extracted without any anæsthetic.

Dr. Walker's experience with gas had resulted in his ceasing to use it. He had numerous cases of patients sick for weeks from taking the gas; believes in avoiding the use of anæsthetics if possible.

Dr. Coy was decidedly in favor of a judicious use of the different agents, especially chloroform and nitrous oxide gas. Anæsthetics should not be blamed for the errors of incompetent operators. In the hands of men competent to use them, he considered the danger too small to be taken into account, when we consider what a boon to society their proper use has been.

Dr. Reynolds mentioned a case of a young lady who, upon seating herself in the chair for the purpose of having a tooth extracted without an anæsthetic, began vomiting; then became insensible, before he had even moved an instrument.

On motion of Dr. Ambler, Dr. Eastlack, of Berlin, Prussia, was elected Foreign Corresponding Secretary.

The Executive Committee for the coming year is as follows:

Drs. J. G. Ambler, of New York; P. W. Weed, Saratoga Springs; R. M. Gage, New York; D. F. Drake, Boston; Charles Merritt, New York.

The convention adjourned until the second Tuesday in August, 1874, to meet again at Saratoga Springs.

AMBLER TEES, D.D.S., *Reporter.*

LAKE ERIE DENTAL ASSOCIATION.

THE annual meeting of the Lake Erie Dental Association was held at Greenville, Pa., May 6th, 1873. The officers for the ensuing year were elected as follows:

President.—Dr. C. B. Ansart, Oil City, Pa.

Vice-President.—Geo. Elliott, Meadville, Pa.

Secretary.—C. D. Elliot, Franklin, Pa.

Treasurer.—F. Herrick, Greenville, Pa.

Censors.—Drs. W. E. Magill, Erie, Pa.; D. P. Stewart, Sharon, Pa.; Jno. Murray, Rochester, Pa.

After a short session of two and a half days' duration, the society adjourned to meet at Oil City, Pa., the first Tuesday in May, 1874.

C. B. ANSART, *President.*

MAINE DENTAL SOCIETY.

The eighth annual session of the Maine Dental Society was held at Skowhegan, August 19th and 20th.

The following officers were elected for the ensuing year:

President.—E. J. Roberts, D.D.S., Augusta.

Vice-President.—W. R. Johnson, Portland.

Treasurer.—Thos. Fillebrown, D.M.D., Lewiston.

Secretary.—Chas. E. Hussey, D.M.D., Biddeford.

Executive Committee.—E. Bacon, D.D.S., Portland; T. Haley, D.M.D., Biddeford; A. H. Chamberlain, Augusta; J. F. Boothby, D.D.S., Portland; C. P. Sawyer, Dexter.

M. D. Johnson, of Skowhegan, and E. G. Briggs, of Augusta, were elected members of the society. Essays were read by E. J. Roberts, of Augusta, upon "Discoloration of the Teeth;" by Dr. Twitchell, of Bethel, upon "Mechanical Dentistry;" and by Dr. A. P. Dudley, of Peabody, Mass., upon "Oxychloride."

The secretary of the New England Dental Protective Association was present, and explained its objects, and quite a number of the members of the society joined the association.

An interesting clinic was given by Dr. Henry Leavitt, the retiring president, illustrating the use of Dr. Mack's retaining screws.

Voted, to hold the next semi-annual session at Thomaston, and the next annual meeting at Dexter.

Chas. E. Hussey, D.M.D., *Secretary*.

EDITORIAL.

We regret that the reports of the proceedings of the associations and convention are of such length as to have crowded out matter already in type, and which we had hoped to present in this issue. We must again ask the indulgence of contributors. Hereafter we shall try to furnish our usual assortment of matter, including "Periscope" and "Hints and Queries."

BIBLIOGRAPHICAL.

An Introduction to the Study of Practical Histology, for Beginners in Microscopy. By James Tyson, M.D.

The substance of this unpretentious little volume was read before the Biological and Microscopical Section of the Academy of Natural Sciences, and is reproduced in book form, as the author tells us in the preface, for the benefit of his own classes.

The growing interest in microscopical investigations, and the increasing necessity for such knowledge by the dental profession, makes the publication of such a guide opportune. While not intended as a substitute for the more elaborate works, it gives in the space of a half-hundred pages comprehensive and condensed information adapted to the needs of the student. The selection of a microscope; the desiderata of an instrument; the measuring and drawing of objects; staining; the study of blood, epithelium, connective, muscular and nervous tissue, cartilage, bone and teeth, are discussed briefly and clearly.

Surely no dentist or dental student can afford not to own this little volume, unless so far advanced in microscopical research as to need a more extensive text-book.

A MANUAL OF METALLURGY. By GEORGE HOGARTH MAKINS, M.R.C.S., F.C.S. London: Ellis & White. 1873.

This is a second edition of this standard work, rewritten and much enlarged; the additions including a thorough description of the various and great improvements in metallurgic operations since the issue of the first edition. A large number of additional and useful illustrations have been introduced, and in the chemical departments the nomenclature has been modified in accordance with recent changes, atomic weights adopted, etc.

As thus improved and modernized, the volume is not only a comprehensive manual for the general student, but contains very much of value applicable to the needs of all who, employing, either as tools or materials, a number of the principal metals, desire to understand their chemistry, the effects of combinations, alloys, etc.

The volume is divided into twenty-five chapters, and is illustrated by one hundred engravings. The first five chapters treat of the general properties of the metals; of the combinations of metals with the non-metallic elements; of the metallic salts and alloys; of heating apparatus, furnaces, etc.; and of the fuels applicable to metallurgic operations. A chapter is devoted to the principles of electro-metallurgy, and one to each of the noble metals. The principal base metals are treated according to their importance, in separate chapters or in association.

The fact that the author is the lecturer upon metallurgy at the Dental Hospital, London, will indicate that the relations of metallurgy to dentistry have not been overlooked.

THINKERS AND THINKING. By J. E. GARRETSON, M.D. Philadelphia: J. B. Lippincott & Co. 1873.

It is but seldom that we occupy space in these columns with notices of books other than those which directly or indirectly bear upon the theory or practice of dentistry; but we may be excused for a departure from established custom, when a contribution to general or special literature is made by a member of the dental profession.

The volume before us is devoted to a review of the history and progress of human thought, the evolution of philosophies, and a comparison and contrast of the lives, characters, and teachings of their chief expounders,—"a contribution to the natural history of those outlying regions of thought and action whose domain is the debatable ground of brain, nerve, and mind."

The author has treated the subject not as a theologian, a scientist, or a philosopher; but with judicial fairness has analyzed, discussed, and criticized the various systems of philosophy which have been evolved by the human mind in the effort to solve the problems of the ages.

In clear and sharply-defined outline, the reader can see the force and the folly, the wisdom and the sophistry, the tendencies for good or evil, of the philosophies of ancient, mediæval and modern times; can understand that philosophy and physics are not antagonistic to theology, as still the common mind of to-day believes, but that theologian, philosopher, and scientist, in seeking to learn the mysteries of life, must come at last to a common starting-point and to a common solution of the great problems. A believer in the irresistible progressiveness of thought,—that the relics of the past are the germs of the future,—he has endeavored to show that the philosophy of Christianity is a progressive evolution, which, overcoming the hostile influences of opposing theories and dogmas, is opening the way to a higher morality and a nobler civilization.

Defining the stages or phases of scholasticism as—1, the absolute subordination of philosophy to theology; 2, their friendly alliance; and 3, the commencement of a separation between the two, he adds: The third period "represents the separation of positivism from theology, and is to an extent the unhappy condition (as it might not inaptly be termed) of to-day,—mutual co-workers separated and denouncing each other where both profess to have in view as a common object the comprehension of truth."

He alludes to the Darwinian theory as undeveloped positivism, and denounces its author as having not only failed to show a single specimen of a type in a condition of progressive evolution, but as also failing to demonstrate the truth of the theory of continuing progressiveness.

So, also, Prof. Huxley is criticized for deductions based on assumptions, and fallacies which carry in themselves their own refutation.

But in the limits to which we are confined it would be impossible to do justice to the volume by any attempt to give a synopsis of it, and we must leave the thoughtful reader to the judgment which, to be just, must be founded on a careful and intelligent perusal of the volume itself.

VULCANITE LITIGATION.

Accompanying this issue of the Dental Cosmos is a supplement embodying the answer filed in the Pennsylvania cases, in which are set up, in a form responsive to the last edition of the bills of complaint filed by the Goodyear Dental Vulcanite Company, all the defenses which the counsel in those cases have raised. This answer is printed with blanks for the title of the cause, and name of defendant, etc., thus making it immediately available wherever the Dental Cosmos reaches.

The variations in minor points of practice in different sections of the country render it advisable that local counsel should be employed in each case, to see that all matters of form are duly observed. Competent attorneys can be found at every point, and we know of nothing better that can be done than the submission to such counsel of the answer above referred to, as affording by very simple adaptation a ready means, after appearance is entered, of complying seasonably with the next requirement in equity (in other words, for filing the answer), and thus avoiding what has heretofore been so fruitful a source of disaster in these suits, to wit: *decrees pro confesso for want of an answer.*

This is intended as a comprehensive and pertinent response to the very large number of letters constantly received, inquiring as to the status of the Cummings Patent, and the progress of suits under it designed to test its validity, but to which it is impossible, by reason of their number, to send individual replies.

To omit nothing that is likely to save the dentist from embarrassment, a memorandum is also appended of the order of these proceedings, in case any action should be necessary before counsel can be reached.

First, every suit in equity must be commenced by filing a bill in the office of the clerk of the United States Circuit Court, within and for the district in which the defendant resides, or is found at the time he is served with the process (subpœna). When such a bill is so filed, the clerk of the court issues a subpœna, which is in the following form

UNITED STATES, } *sct.*
................DISTRICT OF..............................

THE PRESIDENT OF THE UNITED STATES

To..

For certain causes offered before the Circuit Court of the United States in and for the....................District of..............................., in the.............. Circuit, WE COMMAND and strictly enjoin you,.. that, laying all other matters aside, and notwithstanding any excuse, you..personally be and appear before the JUDGES OF THE SAID COURT, at a Session of the same Court, to be holden at ...., on the first Monday of..................................next, to answer concerning those things which shall then and there be objected against you, and to do further and receive what the said Court shall have considered in this behalf. And have you then there this writ. And this you are in nowise to omit, under the penalty of FOUR HUNDRED DOLLARS.

NOTE.—The Defendant in this case....................required to enter ....appearance in the Clerk's Office of said Court, on or before the first Monday of ....next, otherwise the Bill may be taken *pro confesso*.

[A TRUE COPY.]

WITNESS the Honorable.................................. ....Chief Justice of the Supreme Court of the United States, at ...., this.................................. day of..................................1873, and in the ninety-....................year of the Independence of the said United States.

....

U. S. Marshal.

....

Clerk of Circuit Court, U. S.

Until the service of this subpœna by a United States marshal or his deputy, the defendant named in the bill filed need not pay any attention to the suit; but when so served with such paper, the defendant should immediately consult counsel and see that his appearance is entered according to the requirements of the subpœna, and, in due course, that his answer is filed. The answer must in all cases be filed on or before the first Monday of the next month after the appearance is entered, without any other notice than the subpœna itself; the United States Court practice differing in this respect from the usual State Court practice, which does not require an answer without notice or rule. From this point the proceedings vary according to the views of the complainants; and as it is impossible to anticipate which one of the several courses open to them they will adopt, counsel should be consulted whenever any further step is taken.

This answer was originally filed in Pennsylvania, New Jersey, and Delaware suits, and also in a suit in Massachusetts brought against Dr. Daniel H. Smith, of Holyoke, who employed counsel at Boston. The result has been an agreement between the counsel in all the above suits to complete and try the Massachusetts suit as a test case, meanwhile suspending all proceedings in the Pennsylvania, New Jersey, and Delaware suits, involving the same defense. The test case will probably be tried in December or January next, and the decision in that case will determine the others which depend upon it, leaving for either side an appeal to the Supreme Court of the United States to settle finally the questions raised in this answer as to the invalidity of the Cummings Patent. Under the arrangement above stated the Company have put in their *prima facie* case, and the defendant is to put in his proofs by the first of November next. Having thus explained the present and prospective situation, we have only to add: Let every dentist WAIT, AND WATCH.

SAMUEL S. WHITE.

OCTOBER, 1873.

THE
DENTAL COSMOS.

VOL. XV. PHILADELPHIA, DECEMBER, 1873. No. 12.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,
FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S., in the Office of the Librarian of Congress at Washington.]

(Continued from page 565.)

HAVING passed that portion of life intervening between the ages of twenty-five and forty-five with comparative exemption from liability to dental caries, we find, quite frequently, marked indications of recurrence of such signs as we have now come to regard as denoting that systemic condition which demands care alike upon the part of the individual, the general practitioner, and the dentist. It is probable that the first warnings are given through the *thoughts* of this time of life, which though not sufficiently powerful or numerous to attract especial attention, much less compel obedience, will quietly inform us that the summit of life's path is *almost* reached; that work cannot be done *quite* as it used to; that an indisposition for exertion is *slightly* recognized; that remarks in regard to *age* are indulged in, with the pleasant result of evoking complimentary comments upon the happy continuance of one's appearance of vigor; and these, together with the growing knowledge that various social, physical and even intellectual indulgences do not yield so full a return of enjoyment as they used to, have a tendency to make more noticeable to oneself the signs of the slight shrivelling of the skin upon the backs of the hands, the appearance of an occasional gray hair, the gradual formation of face-lines and wrinkles, the trifling diminution in the acuteness of sight, and possibly the occasional involuntary placing of the hand behind the ear to aid the impress upon the auditory nerve. These, like the infrequent dropping leaves of early autumn, usually attract but passing notice; but also like them, they are full of meaning. Now is the time when life power is standing at bay, struggling to maintain itself against the inevitable, and according to individual power contending with all depressing influences; again, pronounced disease assumes the typhoid tendency, or culminates with irri tability; *again the teeth point most directly to existing systemic condition*; local or general tenderness is oftentimes annoying; those predisposed to abscess give evidence of the incipiency of inflammation, and dentures which have been exempt for years from caries, will now present indications of more or less rapid local disintegration. It is probably during this "period" of dental caries, that the predisposition of certain teeth to decay is most singularly illustrated, for we will find at this time, for example, that cuspids (teeth comparatively little liable to decay) will in a few months have cavities extending even to the pulps, and in the same mouth bicuspids and molars with all their accepted predisponents to decay will be left untouched. This is by no means universally or even frequently the case, but is, I think, more frequent at this period than at any other. In years gone by, when noticing this marked tendency of any given tooth, and after one or two decidedly ineffectual attempts at arrestation of the progress of decay by filling, it was my practice to advise extraction, but soon the instances so multiplied in which the tooth *next predisposed* to decay rapidly gave evidences of this condition, that I was compelled to advise and *strongly urge* repeated and persistent efforts in resisting to the end the destruction of the organ selected by natural tendency. For the past ten or twelve years this has been my practice, and the record I can offer is, that in no instance during that time has any patient lost more than one tooth during any period of decay, and not more than one-fifth of one per cent. (one in five hundred) has lost even the predisposed tooth. The length of duration of this period of decay is, as a rule, not more than from two to five years; the type of decay is usually rapid, and the characteristic result is remaining horny or softened (even to pulpiness) dentinal tissue. It is in this connection, again, that general systemic aid in the way of reduction of labor, increase of rest, careful selection of nutritious food, frequent and regular reception of moderate quantities of nourishment, in decided contradistinction to infrequent, irregular and excessive feeding, liberal allowance of sleep, and, if requisite, the addition of those best of strength-givers, change of scene and air, together with the occasional administration of an indicated tonic, will produce results most pleasing in their promptness and continuance. The thoughts become brighter, the step elastic, the brow smooth, the ability to do, renewed, the power for enjoyment refreshed, and the individual feels and truly says, that "a new lease of life has been taken." Concomitant with this, dental caries ceases so completely that I have seen cavities of decay of this kind, which from circumstances had been left unfilled for ten years, in better condition, from vitrifaction of dentine, than even those which had been filled during the same time, and from which the clean edges of prepared cavities had been broken.

And now another interval of more or less complete exemption from decay occurs, which continues usually for some ten years or thereabouts, and then at the age of fifty-five or sixty all those various tendencies which have been enumerated as diagnostics of a "period" again occur. It is now that the hair and beard whiten most notably; it is now that the wrinkles deepen and multiply; it is now that the hearing is perceptibly lessened, and that aids to vision are resorted to as the requirements of a *natural result.* It is now also that even those teeth which have given good satisfaction almost uninterruptedly all through life, begin to announce their sympathy with general decadence, and, through the agency of the fifth pair, call forth the wondering query as to "why teeth could not last forever?" If many teeth remain, either general tenderness and general disposition to loosen or decay, or both, become pronounced, or special tenderness, looseness and decay are remarkable, and tend toward being, and sometimes are, unamenable to treatment. If few teeth be present, the difficulty becomes complicated from the amount of work which is required from the few remaining organs; mastication, already limited, becomes so circumscribed as to afford but little aid in this time of need, and caries ordinarily progresses so uninterruptedly as to suggest to the minds of both patient and practitioner that wholesale extraction which at this time of life prepares the mouth for that last resort,—the artificial denture. This is the time when every united effort should be made to preserve the natural teeth, instead of resorting hastily to this last expedient. This is the time when the whole judgment of the practitioner should be seriously brought to bear upon those considerations which must so much influence the comfort of the declining fifteen years of life, if so much shall be vouchsafed. This is the time to remember how much more can be done by two antagonizing natural teeth, than by the great majority of complete sets of artificial teeth; and it is emphatically the time for "counting the cost;" not from the pecuniary stand-point *alone*, while giving to that its full importance, but from the broadest view of the subject; for what is done now is done for life, and every little that is done wrong, is done at a time of life when "nature" cannot be relied upon for that extra effort which is so oftentimes given in earlier years. The temptation is almost irresistible in this connection, to digress from the subject of systemic influences affecting dental caries, and plunge into the broad field of argument in favor of the salvation of the natural teeth. It was at this point, during the progress of lectures, that I felt at liberty to do so, and it is the evident inappropriateness of such a course at present that compels a feeling of thankfulness upon my part that I have been favored to have had many opportunities for so presenting my convictions in this respect, to my classes of *fellow students*, as that they have been able at once to disavow for me those narrow views which would tend to the saving of natural teeth at all hazards, and at the same time assure me that as the result of my efforts they would each one save hundreds of teeth that would have otherwise been sacrificed. I would then teach that during the "period" of sixty, it should be borne in mind that life is naturally drawing near its close; that operations which would be judicious at thirty would be uncalled for now; that an amount of manipulation which would be demanded by the exigencies of middle life might be positively detrimental so much later from both systemic and local considerations; that such evident pathological conditions might exist in connection with some of the remaining teeth as to render it unwise to expend time and money in the attempt for their restoration; but that this is no argument for the removal of such teeth as would subserve well for even a few years the purpose of mastication, or aid in that immense relief which is afforded the whole economy through the agency of even the slightest support given to artificial work by clasps.

It sometimes happens that with few exceptions (possibly none), all the teeth last well, even to extreme old age. When this is the case, and at the age of eighty or more a "period" of decay occurs, we find that utter breaking up of all life's bonds most wonderfully exemplified in that form of dental caries known as "senile decay." This kind of caries is not necessarily very rapid; indeed its progress is quite in consonance with the general characteristics pertaining to each individual case. Thus, one who gradually relinquishes hold upon the cords of life will present that gradual decay of the teeth which will permit easy combating, with the affording of much comfort, while on the other hand, I have had senile decay to occur so rapidly as to expose largely the pulp in a tooth which was without spot or apparent blemish fourteen days before; a very loose tooth had been extracted by my fingers at the time of examination, and the tooth spoken of had been pronounced perfectly sound after careful inspection; the patient, aged eighty-four, was after a long, hale life, rapidly weakening, and died a few months after, quietly, of complete exhaustion. A certain amount of material has been contributed by various writers in this direction of systemic influence affecting the teeth, and much that is very interesting and instructive has been offered in relation to the specific effects of certain definite conditions, but with all the research in this matter there is yet much that is almost purely speculative in its character. My own observations in this connection have led me to such indefinite conclusions as to have rather tended to force me into considerations having a broader base upon which to establish views. I have recognized, in common with others, the seemingly indisputable effects upon teeth of syphilitic transmission, but beyond some claimed peculiarities of shape I have never been convinced that syphilitic taint could be in anywise diagnosed by peculiarities pertaining to dental caries in suspected cases. I have frequently made *guesses*, based upon the location of pits in enamel, in regard to the period of life at which children have had measles, chicken pox, scarlet fever, or other eruptive diseases; and have sometimes astonished myself, even more than I have impressed the parents of the little patients, by the accuracy of the *coincidence.* So often is this the case, that I have come to regard with some favor the belief that the existence of these markings may be due to the direct impress of these several diseases; but militating with accuracy, in this matter, is the seemingly immense disproportion between the large number of children who have these eruptive troubles, and the small number who have the pitted or denuded teeth; and again, even these markings would seem to have little, and perhaps nothing, to do with the subsequent development of caries, from the fact that this condition is of marked infrequency in these depressions when compared with other fissures in the teeth. Again, I have thought at times that observation pointed to pits and depressed lines as diagnostic of the systemic influence of such diseases as chicken pox and perhaps small pox, and perhaps such other skin affections as are indicated by the papular character of the eruption; but, as I have intimated, nothing definite, and above all nothing practically useful, has yet presented itself to my mind as the result of these investigations. Struma seems, most of all recognized diatheses, to so impress teeth as to predispose to decay, and yet even this impress seems to be so modified by temperament as to result in the most diverse expressions of which caries is capable; thus patients of lymphatic temperament have those large, waxy, dull white teeth of loose texture, which under the influence of struma develop a rapid decay, resulting in complete disintegration of entire teeth without any concomitant pain even from touch; while the nervo-bilious temperament will, under the like influence, develop in its long, pearly, cuspy teeth a horny caries, which is exquisitely sensitive to the action of any and all irritants, and painful to the slightest touch, even when its presence is absolutely invisible to the naked eye.

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,
PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 572.)

THE PAROTID REGION.

THIS is perhaps better called the retro-maxillary space,—a name proposed for it by recent German writers. It is an innovation we must be prepared to accept. For the nonce we will retain the old name, and define it as follows: It is bounded anteriorly by the ascending ramus of the lower jaw, posteriorly by the external ear and the pars tympanica of the temporal bone, superiorly by the convergence of the above-named lines, and inferiorly by a line drawn from the mastoid process to the angle of the lower jaw. This answers to the anterior border of the sterno-cleido-mastoideus, and the posterior belly of the digastric muscle. The floor of the space is crossed by the styloid process and its muscles; beyond these lies the lateral wall of the pharynx, toward which a process of the parotid gland is directed but does not quite reach.* That part of the space occupied by the parotid gland is known as the "bed of the parotid," and is in addition to the above limits defined externally at a level of the ascending ramus of the lower jaw. It will be remembered that it is at this point that the temporal vessels are found, together with the branches of the facial nerve. It is convenient to speak of that portion of the gland *below* the parts mentioned as the deep-seated, and those *above* as the superficial. The superficial part is in contact externally with the parotido-masseteric fascia, and extends over the posterior fifth of the masseter muscle. The deep-seated part occupies the "bed" above described, and adjusts itself accurately to its walls.

In health the parotid cannot be said to have a well-defined capsule. But in diseased conditions a capsule is formed which enables the operator to enucleate the gland with comparative ease,—the situation of the gland and the important vessels traversing it, however, at all times making it a serious undertaking.

It is important for several reasons to remember the bearings of the parotido-masseteric fascia. When a swelling forms beneath it, as in mumps, it is prevented from appearing on the surface, and the turgescence is seen to best advantage upon the neck below the angle of the jaw,† or more rarely within the pharynx, where it interferes with deglutition and the depression and elevation of the lower jaw. Pus forming beneath the fascia gives little or no evidence of its presence. If a swelling due to it be present, it is of a flattened form.* Sometimes the fluid, not finding vent externally, passes posteriorly, and effects exit into the external auditory meatus, as narrated by Velpeau.†

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* Extirpation of parotid. Beclard. *Archiv. Général*, March, 1824. Trans. in *Lancet*, Feb. 29th, 1824.

The following is an account of bed after removal of tumor: The masseter dissected, facial artery bare, but not opened, was pulsating in front of lower part of masseter: the mastoid process and the sterno-cleido-mastoideus cut in front and on its inner surface, formed the posterior part of wound. Internally the styloid process, the external carotid, secured by two ligatures, the stylo-hyoideus, digastricus, and a little lower, the small portion of the tumor that was tied, formed the floor of the wound, which opened into the meatus auditorius externus. Patient died three weeks after operation. Post-mortem appearances: external carotid lost in fibrous tissue, the result of the cicatrix, which occupied the region of the parotid; there was no vestige of the gland. Internal jugular vein obliterated at the same height, but it was discovered a little lower down, communicating with the superficial branches.

† According to Monteggia (Malgaigne, Chir. Anat., i. 455), the swelling of the parotid gland in inflammation may press the condyloid process forward, thus simulating dislocation of the lower jaw.

The extension of a parotid growth may be reasonably expected from the position of the fascia in question to be less apparent on the face than about the angle of the lower jaw. Now it is here that the inferior lobule of the gland is found, which is much more free than the remainder of the gland, and often holds intimately within it the external carotid artery prior to its becoming the temporal. It follows that extirpation of the parotid in such cases becomes as much a cervical as a facial operation.

When a tumor is removed it also follows that the parotido-masseteric fascia is destroyed; and should the growth recur, it will from this fact be more conspicuous upon the face, since it no longer is resisted by the fascia, as has been observed by Schuh.‡

The free inferior lobe of the parotid may be the seat of separate diseased action. Access from this point to that overlying the wall of the pharynx is easy, and it is not without surprise, therefore, that we learn that growths from this portion of the gland may affect the pharynx indirectly by pressure or directly by transmitted diseased action. Allan Burns§ long ago pointed out a sacculated condition of the lobe, which originated from behind the lower jaw and spread downward and laterally upon the neck. It lay beneath the deep fascia and fluctuated obscurely.

In the following case a congenital tumor, from about the angle, extended upward and inward to involve the pharynx. It is especially instructive in showing the lines of probable complications of tumors in this position. A child of two years of age came under the notice of an English surgeon, with a tumor under the left angle of the lower jaw. It had caused dysphagia and dyspnœa by its pressure inwards, for which tracheotomy was performed: several abscesses subsequently formed about the neck. The child finally died from suffocation. At the autopsy a fibrous tumor was found extending from the region of the angle to the pharynx, from the side of which it passed across the pharynx, occluded the right posterior nares, and distended the inter-tonsillar space. Erosions of the transverse process of the atlas and the angle of the lower jaw were seen.

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* Hyrtl, Topog. Anat., i. 331.

† Velpeau, Chir. Anat., i. 26.

‡ Hyrtl, Topog. Anat., i. 338.

§ Surgical Anatomy of the Neck, 18—, 303.

Aneurismal conditions of the gland may from similar causes produce symptoms of suffocation and pulsating tumors in the region of the tonsil.

The superficial portion is rarely the seat of cancer. It almost invariably begins in the deep portion of the gland, and early involves the facial nerve by pressure. This fact may be of great use in the diagnosis of the early stage of parotid cancer.

Cystic tumors, on the other hand, may be found only within the superficial portion. Fergusson has given us a good rule on the subject of parotid tumor. According to this eminent authority, if the skin can be freely lifted from over the tumor it is probable that the tumor can be removed, whether cystic or otherwise, without necessitating the removal of the entire gland; but if the skin is tense, infiltrated, and fixed, it indicates that the entire gland is involved, and, as a rule, it is best not to operate.

Tumors may arise within that portion of the gland over the masseter muscle; these may be due to engorgement of the socia parotidis or the result of occlusion of one of the accessory ducts. They are freely movable at first, painless, and excite at times an increased flow of saliva. It is important to discriminate between these swellings and enlargement of the lymphatic glands of this region, or incipient enchondromata. The latter tumors are elastic, and resemble a small cyst, for which they have often been mistaken.

Inflammatory obstruction of the parotid duct will cause intumescence of the gland, yielding unusual symptoms. Since the duct of Steno cannot be traced deep within the body of the gland, the swelling will be confined to the superficial portion. The mass differs from other swellings of the region by the presence of a ridge (seen within the mouth) placed between the masseter and the cheek. There is sometimes little or no pain, at others a sense of soreness only. This rare condition was first accurately described by Allan Burns (*loc. cit.*).

Calculus of the parotid duct has been described. Mr. Burton Shilltoe* discovered in such a case an impervious duct, which was swollen and felt like a hard cord along the cheek. Suppuration in the body of the gland ensued, with the escape of the pus externally.

As an addendum to the region of "the temple and angle of the jaw," we may state that the relations between the lower lobe of the parotid gland and the transverse process of the atlas are of peculiar significance, not so much from a structural as a clinical point of view.

In emaciated subjects the transverse process of the atlas can be distinctly felt beneath the integument. The distance between the transverse process and the angle of the lower jaw is not greater than half an inch. The process, however, is not visible until the anterior tendinous margin of the sterno-cleido-mastoid muscle is raised from over it, the abundant tough fibrous tissue which underlies the muscle at that point is removed, and a deep-seated lymphatic gland which is lodged below the process is pressed aside. We now see the process, with its relation to the levator anguli scapulæ and the splenius colli muscles. We are not apt to associate the atlas as a part of the region about the angle of the jaw; yet that it is to be so cannot be ignored. Dr. H. J. Bigelow,* than whom there are few more sagacious observers, has given as his belief that cystic tumors of the neck *almost always* arise from the parts about the transverse process of the atlas and the styloid process of the temporal bone.

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* Trans. Path. Soc. London, 1865, xiv. 158.

(To be continued.)

ALUMINIUM. †

BY C. SAUER, BERLIN, PRUSSIA.

(Translated from the Original Manuscript, by Miss L. Jacobi.)

In my last article on aluminium I gave the results of my study and knowledge up to that period. Some important points were barely touched upon, as I was still at work upon them, and others were not mentioned at all. Among the prominent points to be considered are the degree of heat required for the flask in casting the alloy which I use at the present time for the cast; the means adopted to prevent the cracking of teeth where they do not join the jaw; in regard to gum teeth, and new alloys for solder.

I stated in my last article that the heat of the flask must be raised to a nearly *dark red* color, but I neither gave the reasons or the details for it. My reasons for preferring this degree of heat are, that contraction of the piece is thus reduced to the lowest possible point; and secondly, the heat of the teeth and that of the fluid aluminium is brought to an approximate equalization. By thus casting, the teeth are not liable to crack when cold, either previous to or subsequent to their removal from the mould.

I referred also in my last article to an aluminium wire, intended to be placed behind the teeth; but since I have decided upon the degree of heat required, I do not regard this of so much importance. This wire may be omitted, without danger, in those sets where the teeth have a short bite and fit exactly to the jaw. It will, however, be found necessary where these conditions do not exist, that is, a long bite, where they do not fit the jaw, or with gum teeth. The wire prevents, to a certain extent, the contraction of the aluminium cast. The explanation of this is that the wire remains firm, and becomes stiffened during the flowing of the metal. The importance of preventing contraction of the aluminium will be referred to in another part of the present paper. The third reason is that the platina pins, at this heat, will not alloy with the aluminium or the aluminium alloys which I at the present time make use of. This annoying result is very obvious when the heat of the flask is carried too high. Great advantage will be gained in determining the heat by using a pyrometer. I invariably make use of it in casting. It consists of a small square iron-melting pot, in which is placed a piece of aluminium or aluminium alloy. This receptacle is made of the thinnest iron plate. Its height is about 1 ctm., breadth 5 mm., and depth 2 mm. At the middle is soldered with gold solder an iron wire. This is bent to a height of 17 ctm. at a right angle, and fitted with a wooden handle. The object of having the distance of the angle of the wire from the melting pot, is to keep this against the lower edge of one of the external sides of the flask. This is placed on the fire, while the flask is kept at a red heat in the furnace. The desired heat is readily understood near or at the melting point of the aluminium. I place in the melting pot thin aluminium or the alloy. The pot is then placed in contact with the flask to test the heat. When it is melted, the flask is to be kept at the same temperature. The aluminium is quickly brought to the melting point and poured into the flask.

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* Boston Med. and Surg. Journ. vol. lxxxvii. 279.

† The first article on this subject, from the pen of Mr. Sauer, appeared in the *Dental Times*. It will be found in No. 2, vol. x. of that journal.—Ed.

Aluminium does not easily combine with metals in heat. I made an effort to diminish this, and have accomplished it in preparing an alloy for solder. I did it to avoid the difference which would be produced in the mouth, between the platina of the teeth and the solder. The solder, with the addition made, does not readily combine with the platina pins, and by the platina addition to it secures a better fusion. The modification of a metal by the addition of certain other metals is justified by the use of metals in alloys to give them qualities possessed by the metals used, whether it be hardness or color. This is illustrated in the quick fusion of solder.

This idea has recently influenced me to make an alloy for the base of sets. Experiments which I made with an aluminium-silver alloy, consisting of ninety parts aluminium and five parts silver, proved to me again how readily aluminium and aluminium alloys take up other metals when exposed to heat. This alloy is much used for fruit-knives. The same result followed as in my first experiments: the platina pins were taken up in the alloy. These places exhibited increased brittleness. This result induced me to add platina to the alloy, to prevent this absorption of the pins. I subsequently observed that the high temperature I had made use of was unnecessary, and that the addition of platina was not required. I, however, allowed it to remain in the alloy, as it increases the brittleness of the metals and at the same time also increases the elasticity when added in a certain quantity. My efforts with the aluminium and silver alloy were to secure an elastic material, and for this reason the qualities possessed by platina could be of use to me. After testing several alloys, I now use the following:

90	grms.	aluminium;
5	"	silver;
0.1	"	platina.

My experience with this alloy enables me to recommend its use. My observation, covering now nine months, proves, with its increased hardness, that it will remain in good condition in the mouth. It is certainly one of the best aluminium alloys for the mouth.

The motives which induced me to add platina to aluminium might have been omitted, but I thought they might be of use in indicating the fact that a high temperature of the flask will injure the cast, and also that my views regarding alloys may be of use to others in working aluminium. My colleagues, who have made experiments from my last article, will have learned by experience that those teeth fitting the jaw will not crack, but that those with gums readily do so. This may be explained by the error in heating and the contraction of the aluminium surrounding the teeth. However small this contraction may be, it is still sufficient to crack the teeth; I would therefore request the closest attention to the rules heretofore laid down. If this care is observed, no complaint will follow after casting. Should the work, after being removed from the mould and thoroughly cooled, exhibit cracks or indicate a tendency to them, it is evident that the pressure of the contracted aluminium was not strong enough in the mould to overcome the counter pressure of the plaster investment. There is no pressure of the investment after its removal from the mould. The teeth are left in the power of the contracting aluminium. The teeth not expanding to half the extent of the metal during the heating process necessarily crack. The tooth on one side is fastened by the pins to the metal, and on the opposite side, at the root, is also surrounded by it. The contraction will necessarily produce cracks. The same result follows when cold, when the teeth are surrounded with the metal on the mesial and distal surfaces. Cracks will also occur when teeth are too much crowded.

By the method I have adopted, the teeth are better arranged in the plaster investment. When the casting is completed, they are not surrounded with the metal, but are simply held by the posterior portion and supported by the root, a small part of which may be invested by the aluminium. Since I have been thus careful in the investment, I have made use of American and English teeth, those which are destined for rubber or gold, using both with equal advantage. Where gold plate teeth are used, care must be taken to have those with long pins. The same care is required in mounting block teeth as with single teeth where they join another. Regard must be had to their unequal diameter. It is, however, necessary that the blocks join with exactness, so that, in cooling, the metal may not press against these portions. Their substance must also not be exposed to pressure from the under and outer, the inner and upper part, as the contracting metal would crack them. Attention is chiefly directed to the care necessary in joining the gum teeth to the jaw, and that they are entirely free of wax on the back and upper part when finished to the base plate. By this care in investment, the flowing of the metal under, against, or over the teeth is avoided, and they will not be pressed from any point. For the same reason, the last block must not be surrounded on the posterior part by the metal. In all cases where cracking is to be feared, the contraction may be limited by the use of the before-mentioned wire. Those dentists who have not worked in aluminium in accordance with the rules I have laid down may deem it unnecessary to dilate upon the contraction of the metal and the proper heating point of the flask, they being already well known; but they will find themselves often in error. Even where all the peculiarities of a metal are well understood, mistakes will occur.

The solders which I make use of at present seem to melt at a lower temperature than those first mentioned. I think they are also more fusible and alloy more readily with aluminium and aluminium alloy. The first is similar to the older one. It consists of

2.9 grms. of gold;
9.0 “ “ aluminium;
1.0 “ “ silver;
2.0 “ “ copper;
0·1 “ “ platina.

The solder used by me at present consists of

2.5 grms. of gold;
9.0 “ “ aluminium;
1.9 “ “ silver;
2.0 “ “ copper;
0.1 “ “ platina.

A solder of gold, copper, and aluminium, formerly used, decomposed slightly in the mouth. The solder of gold, platina, copper, and aluminium, mentioned in my first article, exhibited in two cases a slight decomposition in the mouth. It became slightly reddish in color, while in the same two cases where the solder of platina, silver, copper, aluminium, and gold was made use of, this discoloration was not present, and the solder remained unchanged. I therefore consider the small addition of platina and silver to the alloy, especially the platina, as more important than gold, especially as the solders at present used show no evidence of decomposition in other cases. The question could be easily settled by applying, on any important places in a new piece, a solder of silver, copper, platina and aluminium. If this solder exhibited non-decomposible qualities, the indication would be to make use of a similar alloy for casting. From this alloy could be formed an alloy, which, while presenting an increased durability, would be also more tough and elastic than those materials used at present.*

The solidity of the kind of aluminium work used by me, in the mouth, proves that pure aluminium plate is the best. Ranking nearly to this is the well-prepared aluminium casting and the solder of gold, silver, copper, platina, and aluminium, and the alloys used by me. If decomposition does take place, it is still useful for wearing many years.

I had for some time in view the composition of a gum-colored enamel for aluminium, but it did not result in anything valuable. The enamel must fuse readily, and when this is the case, decomposition speedily ensues in the mouth. I therefore paid more attention to the composition of gum lac. The most durable in the mouth seems to me to be one that accidentally fell into my hands. It consists of white shellac dissolved in alcohol, and colored with carmine, and tempered with oxide of zinc and glass powder. It resembles a cement filling. It should be placed on a rough and warmed surface, and well dried. It can always be used freshly made. Where it has been long standing, the substances separate from each other, and do not mix well again. It may be possible to bring the shellac to a fluid condition by heat, and then mix the carmine oxide of zinc and glass powder. It must be used then from the warmed plate. A better covering than this is rubber. This must be directly vulcanized upon the set. I have fastened, in such cases, thin plates of pure rubber upon the roughed aluminium plate with a solution of rubber. This solution must be previously dried and the aluminium plate heated. If the plate requires repairing, the latter may be fastened by a pin upon the roughened surface. In this way it may readily be removed and replaced.

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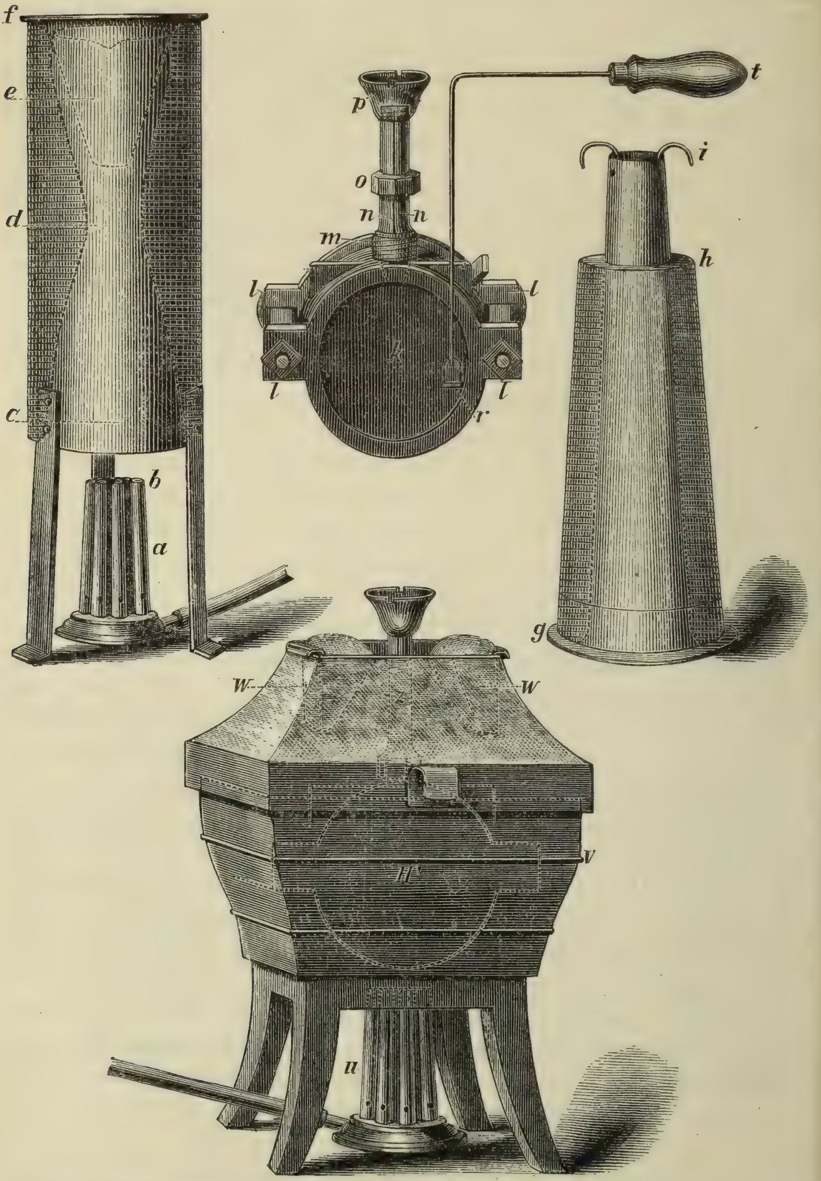
* In a communication received by me from Mr. Fr. Schultz, he states that he has in present use such an alloy of silver, copper, and aluminium for telescopes. My supposition of its greater elasticity has been evidenced in this manufacture. It is only, therefore, necessary to test with or without the platina addition to the alloy, whether it remains undecomposed in the mouth.

I notice, in the published report of foreign patents of the Chemical Society of France, a patent has been secured for the addition of platina to nickel alloys and aluminium bronze.

Diagram of the Apparatus used in the Aluminium Work of C. Sauer.



a, The Bunsen six-burners, with outlet at *b; c*, *d*, *e*, *f*, melting stove; the small lines indicate the lining of chamotte; *d*, the melting-place for smaller melting pots, the contents of which require a higher temperature; *e*, melting-pot for melting aluminium; *f*, upper rim of the oven; above this goes *g*, *h*, *i*, the under part of the chimney; the chimney itself is covered to *h* with a cloak; in the spaces between is chamotte filling; at *i* are hooks to retain the chimney; the flask *k* has at *l*, *l*, *l*, *l*, fork-shaped processes for fastening two screws, which keep together the cover of the flask and also the latter; *m*, screw at the flask, for both halves of the outlet; *n*, *n*, *o*, screw, to fix both halves of the outlet on; *p*, casting funnel, screwed on to the two halves of the outlet; *r*, little melting-pot, used to measure the heat at its place at the flask; *t*, handle to it; *u*, six Bunsen burners under the compound; *z*, flask; this is standing in *v*, the warming stove; the cover has a long square opening, through which both are inserted; *w*, *w*, for the fixing of the heat around the flask.

I do not consider as closed my investigations of aluminium castings for sets. I anticipate greater results from the hands of other dentists, who in giving it support may complete the work. I believe I have called attention to many important points in aluminium and metal cast work, and so far may be useful. If I succeed in making further important observations, I shall communicate them to the profession as soon as they, in my opinion, have taken shape. I would ask of my fellow practitioners that they will adopt the same course.

THE FATAL CASE AT EXETER.

BY GEO. WATT, M.D., D.D.S.,

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THE DENTAL COSMOS for May, 1873, probably gives about all that is known in reference to the death of Miss Wyndham, from the administration of nitrous oxide by Mr. Mason, of Exeter, England. The case, in all its bearings, should have been more thoroughly investigated and more fully reported. But much can be gathered from the imperfect report given us.

In the statement of Mr. Braine we are told, "The gag used was an ordinary wooden one." This sounds badly; for when the gas is pure, and properly administered, there is not the slightest call for a gag of any kind, as the muscles are then pliable, and the mouth may be opened without any difficulty. In the regular and somewhat extensive use of the gas since the summer of 1866, I have never resorted to a gag, and never felt the want of it. But in the Exeter case the muscles became rigid, as we learn by the statement, "It needed great force to separate the jaws." This rigidity of the muscles proves that the patient was partially smothered in her own breath, or that the gas contained something besides nitrous oxide. We have similar proof in another statement: After the tooth had been extracted, Mr. Mason, "for the first time, saw the blueness of the face, but Dr. Pattinson had noticed it before. The symptoms then became alarming: the features appeared puffy and swollen, the eyeballs protruded, the breathing became thick and stertorous." These symptoms all point in the same direction; and they cannot be produced by pure nitrous oxide, properly administered. The patient was smothered, or the gas was not pure.

In commenting on Mr. Braine's report of the case, the London *Lancet* has this remarkable statement: "Indeed, a leading dentist told us but a few weeks since that he never operated till the breathing had temporarily ceased." But a "leading dentist" may not have had time or opportunity to study the subject of anæsthesia, or the properties of nitrous oxide. At any rate, he has not studied them. But few leading dentists in America have studied them, because too closely engaged otherwise.

Dr. Drake was called to the case by Mr. Mason, and at the inquest he testifies that "she was as powerless to breathe as though she had been immersed in water." We are told that he "put his finger into the throat, and she made three or four expiratory movements, accompanied by a slight sound."

At the beginning of the operation, "Dr. Pattinson took charge of the pulse in the left wrist. After half a dozen respirations he said the pulse was not so rapid, but its volume had not varied." This is quite common. The pulse is usually quickened by the mental emotion incident to the occasion, which emotion is soon overcome by the gas, when the heart beats with its normal speed. But when there is no fear of the gas, or dread of an operation, the pulse is not quickened if the nitrous oxide is pure. This statement is made on the authority of several hundred carefully observed experiments.

In decomposing nitrate of ammonia by heat, several results may be obtained. The decomposition aimed at may be illustrated by the equation, $NH_3NO_5 = 3HO + 2NO$. I use the old notation, and omit the water of crystallization. When only this order occurs, the sole results are water and nitrous oxide. And let the temperature vary as it may during decomposition, this order is predominant; but when the heat runs too high, *nitric* oxide is also formed, in greater or less quantity. The order of decomposition producing it is probably $NH_3NO_5 = HO + 2NO_2 + H_2$. At any rate, the formation of nitric oxide may be noticed by the infinitesimal explosions in the retort or decomposing flask, different from the agitation of the fluid caused by the rapid escape of the gas. These explosions are caused by the union of the nitrous oxide of the first equation with the hydrogen of the second. The presence of nitric oxide, in such cases, is a recognized fact, and should always receive due consideration.

Nitric oxide cannot be breathed, unless very much diluted. Spasm of the glottis is produced by a single attempt to inhale it in a concentrated state. When diluted so that it can be breathed, it soon suspends respiration; but the sensation is like a tonic spasm of the muscles of inspiration, and not like paralysis of the muscles of respiration, as suggested by the *Lancet*.

In my earlier experiments with the gas I have seen such symptoms, and always, when analyzed, found nitric oxide in the gas. But, not resting content with this evidence, I prepared pure nitrous oxide and pure nitric oxide, mixed a gallon of the latter with sixty gallons of the former, and breathed three or four gallons of the mixture. Violent, and nearly fatal, tonic spasm of the muscles of inspiration ensued, which, after partial relief, would suddenly return with great force, at longer or shorter intervals, for about forty-eight hours. The respirations were reduced to six a minute, between spasms; the face became livid and swollen; and I felt as if a broad iron band had been compressed around my neck. Altogether, I regard this as the most dangerous experiment I ever tried; and I sincerely hope no one will repeat it.

When nitric oxide, even in very minute quantities, is present, the inhalations will result in rigidity of the muscles, so as to firmly close the mouth, defeating the operation of extraction, unless a gag has been used. And a state of similar rigidity may be produced by carbonic acid. I have never seen the patient's own breath administered along with nitrous oxide, without closure of the mouth, as described in the Exeter case. And the same condition may occur from a want of freedom in the expiration. But few inhalers have the openings for the exit valves sufficiently large. The inhalent valve should allow perfect freedom of inspiration; and the exhalent one should be more than twice as large.

Some of the statements of the London *Lancet* in reference to this case are reckless. For example, it says, "Nitrous oxide, indeed, is not an anæsthetic at all." If it had told us that sugar is not sweet, I would have tried to believe it; but, as I have been anæsthetized by nitrous oxide oftener than I have tasted sugar since 1866, I must respectfully ask to be excused.

The *Lancet* further tells us that nitrous oxide acts by suspending respiration for a brief period, which proves a total lack of practical observation in regard to it. The first inhalations induce a very rapid escape of carbonic acid from the lungs; consequently, atmospheric air should be freely admitted, alternately with the gas, till the breathing is tranquil. After a short time thus spent, nitrous oxide will support respiration almost indefinitely. I have often seen patients breathe it tranquilly, and without pallor or lividity, for fifteen minutes; not showing the slightest symptom of suffocation, or lack of power in the heart's action. I breathed it an hour myself, with but eleven inspirations of atmospheric air during the time, and attended to my ordinary duties the remainder of the day without inconvenience. I administered it to a delicate woman, from 9 A.M. till 12.30 P.M., while a surgeon straightened one of her inferior extremities, which was anchylosed at an acute angle; and at 2 P.M. she partook bountifully of coffee, biscuits, butter, broiled chicken, fruits, etc., passed the rest of the afternoon in cheerful conversation, slept well at night, and two days afterward submitted to a similar operation on the other limb, with corresponding results, and rode home, in a private conveyance, the same evening, a distance of twelve miles. There was at no time any blueness or lividness of complexion; and the anæsthesia was highly satisfactory to the experienced surgeon in charge of the case, who considered his patient too delicate to take chloroform or ether, and had postponed the operation for years for want of a safe anæsthetic.

In reference to this Exeter case, we are told that "Dr. Drake put his finger into the throat, and she made three or four expiratory movements, accompanied by a slight sound." The *Lancet* interprets this as evidence of paralysis of the muscles of respiration. But why expiratory, instead of inspiratory, when the glottis was disturbed by the finger? Probably because the chest was expanded already to the utmost limit of inspiration. At least I have so seen it always, in cases where nitrous oxide (so called) had interfered with the functions of respiration. And if this inference is correct, it follows almost necessarily that the patient was poisoned by nitric oxide. I have seen no account of an analysis of the remaining gas, but it should have been carefully tested.

The *Lancet* further states, "The continuance of expiratory sounds under the influence of artificial respiration, the dusky, tumid face, the protruding eyeballs—these all indicate, as plainly as symptoms can indicate, that the *inspiratory* muscles had been rendered suddenly and hopelessly powerless." In the partial report before me, I see no account of systematic or efficient artificial respiration. Dr. Drake putting his finger into the throat, however, was most likely with reference to artificial respiration. There is but little doubt that careful observation would have found the inspiratory muscles as rigidly contracted as were the muscles of the jaws; and from the way they compressed the gag, they were scarcely paralyzed. When I was poisoned with nitric oxide, this was the case; and the difficulty was to get the breath out, not in. And this has been the trouble in every such case I have seen; and when the remaining gas has been examined, it has been found to consist, in part, of nitric oxide. Instead of paralysis, I infer tonic spasm of the inspiratory muscles.

I fully agree with the *Lancet* when it says, "We hold that the death, which was clearly caused by arrest of respiration, was the logical sequence of the action of an agent that produces the most perfect possible suspension of respiration." But the agent that did all this was, almost certainly, *nitric*, and not *nitrous* oxide. It is barely possible that chlorine or carbonic acid (from the breath) was the fatal agent in this case. The symptoms described cannot be induced by the direct action of nitrous oxide.

Would it not be well for the *Lancet* to bear in mind that nitrous oxide has been administered oftener, in the last eight years, than all other anæsthetics have been since the dawn of science? In a majority of these cases it has been administered ignorantly; in many, recklessly; in some, foolishly; and in others, stupidly; and yet but two fatal cases are reported. In one the patient was smothered; and in this one she was poisoned by nitric oxide, if symptoms can indicate anything.

In an editorial the *British Journal of Dental Science* says, "The recovery of the color of the blood is so immediate on breathing pure air, that some return of natural color ought to have been produced." From this I fear that the editor regards change in the color of the blood, or lividity, as an ordinary and legitimate result of the administration of nitrous oxide. But this is all wrong. The pure gas has no such tendency. I use it daily, and pass months without seeing such a result. The retention of carbonic acid is the usual cause of the darkening.

A brief comparison of nitrous and nitric oxide may be profitable here. Both are invisible gases, composed of the same elements, in chemical union. In the nitrous, these elements are held by such a feeble affinity that very slight causes separate them, as is proved by the fact that this gas supports combustion almost as well as free oxygen. But with the nitric, which is twice as rich in oxygen, nothing of the kind occurs. It does not support combustion. On the contrary, instead of parting with oxygen, the nitrogen urgently demands twice the quantity in its present possession, and is able to take it from most compounds containing it. This changes the nitric oxide to nitrous acid (of the old nomenclature), one of the strongest caustics known to chemistry. In atmospheric air, or free oxygen, the change to nitrous acid is almost instantaneous. And nitrous acid, in the presence of water, is almost as promptly changed to nitric acid.

When either of these gases is taken into the air cells, it tends to obey the law of gaseous diffusion, and thus pass into the blood. If nitrous oxide reaches the blood, it tends to part with its oxygen, in obedience to stronger affinities; and that it does so is evidenced by the great increase of oxidized matter carried off by the skin and kidneys after taking it. But let nitric oxide reach the blood,—in its urgent demand for more oxygen, is it not likely to take the oxygen of reserve from the red corpuscles, thus destroying their function, and, by changing to nitric acid, destroy their vitality? But much of its mischief is done without reaching the blood. In the air cells it finds atmospheric oxygen and vapor of water. Nothing else is needed to effect the change to nitric acid, which, by cauterizing the lining membrane of the air cells, arrests the ingress of oxygen and the exit of carbonic acid. In mild cases of poisoning by this gas, the symptoms increase in severity for several hours; and this is readily understood when we consider the cauterization of the mucous membrane.

Nitric oxide is as likely to be obtained from pure, as from impure nitrate of ammonia, and its presence is the greatest source of danger in the use of nitrous oxide. I have so often alluded to this that I need only mention it here.

Then how should pure nitrous oxide be administered for anæsthetic purposes?

If practicable, have the patient in ordinary health. With women, avoid the menstrual period and the two or three days preceding it. See that the valves of the inhaler are sufficiently large, and that no part of the chest is compressed. Seat the patient in a comfortable position. This is very important, for a hyperæsthetic state precedes the anæsthetic, which renders a constrained position very unpleasant. If inexperienced, let the patient breathe atmospheric air, freely and fully, through the inhaler, thus gaining familiarity with it; but, if already experienced, let similar free, full breathing be practiced, for half a minute or more, without the instrument. The object of this is to carry all the carbonic acid out of the air cells. Place the inhaler between the teeth, turn on the gas, and while breathing it, give the patient air through the exit valve, as often as it is wanted, especially at the early stage of the process. Avoid everything that suggests smothering or confining the patient. Don't be in a hurry. Tell the patient, at the outset, not to breathe through the nose, and that you will aid by compressing it, if necessary. Keep quiet; but, if necessary, speak softly and slowly, but by no means whisper. Learn to know by the countenance, and by general symptoms, when the patient is anæsthetized.

After the operation is over, remain by your patient, in a calm, attentive attitude, as consciousness or the normal state returns. Speak calmly and slowly, at first. Avoid everything that suggests excitement.

And when the profession and the public reach the desired degree of education in this direction, the anæsthetic state will ordinarily be reached without loss of consciousness.

PEPSIN AND IODOFORM.

BY J. W. KEYES, MONTGOMERY, ALABAMA.

(Read before the Alabama Dental Association.)

In February last I read before the Montgomery Dental Society a short paper on the use of pepsin and iodoform in dental practice, and commenced a series of experiments with them. By some mischance, I have mislaid or destroyed both the paper and my notes of cases.

I desire to call your attention to these agents, and hope you will give them a trial, and see if we have, as I believe, in them very important additions to our dental remedies.

Pepsin, as you know, is the active, solvent principle of the gastric juice; and animal substances are dissolved in a solution of it at about one hundred degrees of Fahrenheit.

All of us have met with great difficulty in thoroughly cleansing and eradicating all remains of putrid pulps. Wash and wipe as often and as thoroughly as we may, there is still a little of the taint left. The tubuli seem saturated with the offensive remains, or some small shreds cling where they are not readily removed; or the canals are tortuous, or too small to efficiently admit your finest broach.

True, chlorines and carbolic acid deodorize, and prevent decomposition to a great extent, but you will agree that it would be much better to remove *all* the matter. Now I believe, and am sustained in this belief, thus far, by the trials made, that a concentrated gastric juice made with pepsin—that prepared from the hog's stomach, I think, is perhaps the best—and very dilute muriatic acid, introduced into one of these offensive teeth and retained there for twenty-four hours or longer will so entirely *digest* all remains of the nerve and its absorbed contaminating fluids, that a thorough washing will wholly remove them.

My plan is to remove all the pulp and defunct matters possible, by washing and by broaches wound with cotton, and then introduce the best pepsin made into a very thin paste with hydrochloric acid diluted near a thousand times, and seal with wax. The next day I remove it, wash well with warm water, and reintroduce. After twenty-four hours, remove; wash, and if, as generally is the case, I cannot recognize any of the peculiar odor, I wipe out well with carbolic acid and fill.

I believe pepsin may be made a valuable adjunct in the preparation of teeth for filling where putrescent matter has been absorbed into partially decomposed tooth substance which you do not wish to remove, by applying as above for twelve or twenty-four hours.

It acts only upon dead matter.

So far as I have used this agent, I am much gratified with the results, and I am indebted to an article in the *St. Louis Dental Journal* for the suggestion.

Iodoform has not, that I am aware, been used by the dental practitioner, but I think in it we have a remedy that exactly meets the requirements of some cases. It possesses the alterative properties of iodine, without its caustic qualities; indeed, it is a very soothing application to inflamed and irritated parts. I have used it with the happiest result in the treatment of old abscesses; and its alterative and anodyne qualities render it just the thing for those cases in which, from the ravages of calculus or from abscess, the socket cells are involved, and that peculiarly annoying neuralgia results from which the patient finds slow relief. In these cases even the extraction of the tooth does not always bring the immunity sought for some time.

To apply the iodoform, take a broach, arm with cotton, dip in glycerin and take up some of the powder; introduce it under the gum and around the roots.

Using glycerin as the vehicle, introduce it into the crown and roots to relieve neuralgia or to cure persistent abscess. In the treatment of antral disease, I regard it as one of the very best remedies.

Used as above directed, its effect is very soothing, and it will speedily diffuse itself and its influence over the seat of irritation.

PROCEEDINGS OF DENTAL SOCIETIES.

TEXAS STATE DENTAL ASSOCIATION.

Pursuant to a call of the Austin City Dental Association, many of the principal dentists of Texas assembled in Austin, Texas, September 17th, 1873, to form a State Dental Association.

The following officers were elected by ballot for the ensuing year:

President.—Dr. W. G. Kingsbury, of San Antonio.

First Vice-President.—Dr. Wm. Stiles, of Austin.

Second Vice-President.—Dr. L. Quinby, of Houston.

Secretary.—Dr. A. A. Beville, of Waco.

Treasurer.—Dr. R. E. Grant, of Austin.

Corresponding Secretary.—C. E. Wise, D.D.S., of Austin.

According to the constitution, the following committees were appointed by the President:

Executive Committee.—Drs. Beville and Clifton, of Waco; and Dr. Boardman, of Austin.

Committee on Membership.—Dr. Boardman, of Austin; Dr. Combs, of San Marcos; Dr. Easterbrook, of Galveston; Dr. Fielding, of Houston; and Dr. Aiken, of Sherman.

Committee on Operative Dentistry.—Dr. Edmonston, of Galveston; Dr. Ward, of Austin; and Dr. Taylor, of Marysville.

Committee on Mechanical Dentistry.—Dr. Tarvin, of Columbus; Dr. Moseley, of Mexia; and Dr. Kerr, of Houston.

Committee on Legal Enactments.—Dr. Kingsbury, of San Antonio; Dr. Quinby, of Houston; Drs. Boardman, Grant, and Wise, of Austin.

The following resolution was unanimously adopted:

Resolved, That the thanks of the dental profession are due to Dr. S. S. White, of Philadelphia, for his disinterested and valuable services in resisting the grasping actions of the Goodyear Vulcanite Company.

After transacting the usual routine business, and adopting the Code of Ethics of the Southern Dental Association, the association adjourned to meet at Waco on the first Wednesday in August, 1874.

A. A. Beville, *Secretary.*

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

The annual meeting of this association was held at the Pennsylvania College of Dental Surgery, on Tuesday evening, October 21st.

The following officers were elected for the ensuing year:

President.—Dr. Spencer Roberts.

Vice-President.—Dr. J. H. Githens.

Recording Secretary.—Dr. E. R. Pettit.

Corresponding Secretary.—Dr. Wm. H. Trueman.

Treasurer.—Dr. E. R. Pettit.

Librarian.—Dr. Robert Huey.

Committee on Membership.—Dr. James Truman, Dr. J. H. Githens, and Dr. Amos Wert.

Committee on Business.—Dr. T. L. Buckingham, Dr. E. Wildman, and Dr. Wm. H. Trueman.

E. R. Pettit, *Secretary.*

BROOKLYN DENTAL SOCIETY.

The Brooklyn Dental Society convened for its sixth annual session, Monday evening, October 6th, 1873; President Dr. Wm. Jarvie, Jr., in the chair.

The following members were elected officers for the ensuing year:

President.—Dr. W. T. Shannon.

Vice-President.—Dr. L. E. Brockway.

Recording Secretary.—Dr. C. P. Crandell.

Corresponding Secretary.—Dr. A. N. Chapman.

Treasurer.—Dr. F. W. Dolbearl.

Librarian.—Dr. C. H. Biddle.

The society is composed of earnest men, thoroughly interested in everything tending to elevate the standard of professional excellence and enlarge their sphere of usefulness, and a truly noble work is being accomplished as the result of associative effort.

C. P. Crandell, *Recording Secretary.*

ERRATUM.

In the report of the proceedings of the American Dental Association, in the October number of the Dental Cosmos, page 529, the name H. A. Smith should have been J. S. Smith.

EDITORIAL.

ORAL SURGERY.

THE *Philadelphia Medical Times*, in its issue of November 1st, taking the editorial of the October number of the DENTAL COSMOS for a text, discusses the question whether Oral Surgery is sufficiently distinct and of sufficient magnitude to be worthy of rank as a specialty of medicine. Admitting specialism to be a necessary outgrowth of the extension of medical science and art, the writer recognizes the danger of carrying it too far,—of dividing up too finely. He then considers the true position of dentistry and of dentists, claiming that the great bulk of the work to be done is purely *mechanical*, and therefore the mass of the profession must spend their lives in a monotonous round of purely mechanical labor, in which mechanical and artistic skill along with personal qualities must be the sole guarantees of success; that the higher education and wider culture of the physician is in no sense a necessity to such success; and that dentists as a class have no claims to be recognized as representatives of a branch of the medical profession. He assumes that, because a man may be an excellent doctor without being a dentist, therefore he may be an excellent dentist without being a doctor, and argues that as cancer of the jaw is essentially the same as cancer of the rib, vertebra, or tibia, therefore there is no necessity for oral surgery being a specialty. The writer, however, practically refutes all that he had written in the final admission that he "*would like to see dental schools attached to our medical colleges, and opportunity afforded our medical students to learn something of diseases of the teeth, or even, if they like, to become practical dentists.*" Diseases, forsooth! why, we have just been told that the work of the dentist is purely *mechanical*. Now it seems there are *diseases* of the mouth, which it is desirable medical students should learn something about. That doctors *should* learn something of dental specialism, and that dentists *should* learn more of physiology, pathology and therapeutics, is just exactly that for which we have been contending. That there is abundant room for improvement in both directions, we are well assured; but especially sure that no branch of medicine or surgery is so little comprehended by the general practitioner as that which is assigned to the province of the educated dental specialist. If in any complex dental lesion the "mechanical labor" of the dentist is not sufficient, heaven help the patient who expects to supplement it with the therapeutics of the average family physician! Or, if such complex lesion should first present to the family physician, he would be in an awkward position if compelled to commend him to the care of one whom he had pronounced in no sense entitled to be recognized as a representative of a branch of our profession.

The one word *disease* is a solution of the whole problem; for without a knowledge of anatomy and physiology, how can pathological conditions be intelligently diagnosed; a clear insight obtained into the causes which interfere with normal results or the morbid changes induced by disturbance of physiological processes; and of what use would this knowledge be to one ignorant of therapeutics?

We claim that a hiatus has existed between general medicine and surgery and dentistry; a hiatus not likely to be bridged by general practitioners; that every day there is needless suffering from the lack on their part of the special information which belongs to the province of the dentist. And while patients may not expect from them the manipulative skill which comes only through practice, they are justified in expecting at least an intelligent appreciation of their difficulties. This they are not likely to have while the general practitioner so far fails to recognize dental pathology,—its regional and systemic relations,—as to designate its treatment as "purely mechanical."

The critic of the *Times* finds further argument against oral surgery as a specialty, because "it has no natural boundaries to limit it;" for, says he, "this very day, chancing to be at the clinic" of the lecturer upon oral surgery at the University of Pennsylvania, we saw present three cases, two of which were tumors on the head. What does this prove, except the advantage of such a general medical education as will qualify for the practice of *any* branch? One who makes oral surgery a specialty, need not, if he elect otherwise, decline the treatment of any case. The argument is only an indorsement of the higher education and wider culture for which we contend.

But let us reverse the picture. "Chancing, this very day," to step in at the house of a medical friend, a general practitioner, we found his wife suffering from an atrocious alveolar abscess, of the pathology and therapeutics of which the doctor was as innocent as a child, and had not recognized the imminent risk of an external disfiguring scar or fistula. This is not an extreme or isolated case. Doctors are proverbially ignorant of the proper treatment of the simplest dental lesions, and we doubt if one in ten can tell the period and order of eruption of the deciduous teeth, or explain the relation of the first molar to the temporary and permanent dentitions. If it be replied that such knowledge ought not to be demanded of the general physician, a fitting answer would be the fable of the dog in the manger. That doctors as a class are not familiar with dental lesions will not be disputed, and the effort to belittle the practice of those to whom they themselves apply when suffering in their own persons from such conditions, is, to say the least, in bad taste.

While therefore we urge a wider range of knowledge upon the dentist, we hail the suggestion that our "medical students be afforded opportunity to learn something of the diseases of the teeth," with great satisfaction; that thus the minds of both may be disabused of the false conception that either may afford to ignore that which belongs to the circle of the other. It is as impossible that any one man should be master of medical science in all its details, as it is for him to attain the best possible results in the smallest specialty except by an appreciation of general principles, which underlie equally the practice of medicine and of dentistry.

Dentists are either artisans or medical specialists. If artisans only, they surely are not entitled to recognition as representatives of a branch of the medical profession; and no mechanical skill, however scientific, no artistic culture, however perfect, should be expected to rank for more than these. If dentistry means only mechanical and artistic ability, these can be acquired without colleges, and employed without degrees; but if its claim to recognition as a medical specialty is worth *anything*, it is worth *all* it represents.

In the article reviewed, we had distinctly affirmed that the attempt to appropriate the honors of a learned profession on mechanical and artistic ability was simply to court ridicule. With so much of the argument, therefore, as is based on the assertion that knowing how to plug a difficult molar or counterfeit a lost incisor does not entitle to recognition as a specialty of medicine, we heartily agree. We not only admit, but have contended, that mere mechanical and artistic ability does not entitle its possessor to the doctorate, but we deny that a man may be an excellent dentist without being a doctor; we deny that the higher education and wider culture of the physician are in no sense a necessity to the practitioner of dentistry, and demand that he should possess the higher education and wider culture, or lacking them should content himself without a title.

The question is not what dentistry has been, but what oral surgery should be; not what are the qualifications of the majority of those now practicing it, but what is its legitimate province, and what the requirements for its intelligent practice. We see no force in the assumption that because the great bulk of the profession have heretofore spent their lives in a monotonous round of purely mechanical labor, therefore they must continue to do so in the future. We claim that the circle of physiological and pathological sympathies existing between the mouth and every portion of the economy demand first a general medical education, and then special training, that the highest results in treatment may be secured. And as each year witnesses a more thorough educational training, so will the field inevitably widen, until the function of the dentist will be merged into a practice of which that of to-day is but a feeble indication. Who doubts this, let him look at the beginnings of ophthalmology as compared with the practice of that specialty in modern times. Who could have guessed its present proportions?—nay, who can yet tell its future triumphs?

The mistake of our reviewer consists in ignoring the variety and importance of dental lesions, and in assuming that they can be successfully combated by mechanical labor,—a mistake he would not have been liable to, had he enjoyed the opportunities which he would like to see offered to our medical students. As to the necessity for special schools for any department of medicine, that is a question open for discussion; but a complete medical education having been obtained as a foundation, on this basis the study and practice of any specialty is entitled to the respect and confidence not only of the community, but of all who base their claim to recognition on a like scientific preparation. We claim, therefore, that a dentist having a common education with the general surgeon is entitled to common honor and common privileges with him, and hope to see the day when distinctions because of different fields of labor will be done away.

PUBLISHER'S NOTICE.

CLOSE OF THE VOLUME.

THIS issue completes the Fifteenth Volume of the DENTAL COSMOS.

The first number of the sixteenth volume will be published January 1st, 1874, and succeeding numbers on the first of each month following.

Dr. J. W. White will continue in the editorship.

Although the circulation of the journal is larger than at any previous time since its publication, and the subscription list is constantly growing, yet, believing that at the price it is a good investment for any practicing dentist, we should be glad to see the list of subscribers largely increased.

Our desire is to add to its usefulness with each volume, and thus to make it more and more efficient in the promotion of the best interests of the profession.

We ask as a special favor that all who intend to subscribe for the next volume will do so *promptly*, that we may determine the number of copies to print.

With this number we send bills to those whose subscriptions have expired.

We shall adhere to the system of cash payment in advance.

SAMUEL S. WHITE.

OBITUARY.

At a meeting of the New Orleans Dental Association, held July 3d, 1873, resolutions were passed expressing the sense of the association in reference to the death of Cyrus S. Knapp, D.D.S. The resolutions covered a most hearty testimony to Dr. Knapp's professional attainments and social character.

BIBLIOGRAPHICAL.

Transactions of the California State Dental Association, at the First, Second, Third,and Fourth Annual Sessions, held in 1870, 1871, 1872, 1873.

This is a handsome volume of 217 pages, containing the business proceedings, essays and discussions of four annual meetings. Copies can be obtained of the Secretary, H. G. Plomteaux, Woodland, California. Paper, $1.25; cloth, $2.25.

PERISCOPE.

Pathological Dentition.—Dentition, though a physiological process, is nevertheless recognized as a frequent cause of constitutional disturbance. Doubtless there are extremists who over estimate the average influence of this process as a disturbing element, as there are those who underrate the difficulties which may attend it. Pathological dentition is by many considered a secondary affection,—a single link in a chain of deranged actions,—and, even when a little patient indicates unmistakably the local irritation, relief is sought by general medication, —relaxants, derivatives, calmatives, febrifuges, etc.; then by local emollients, fomentations, and anodynes; and lastly, if at all, by lancing the gums, when redness, tumefaction, induration, or the whiteness of the coming tooth seems to demand it. These signs are indeed assumed to be the only possible justification of the operation. If the gums are tumid, tense, and shining, swollen up into a kind of little tumor over a particular tooth; if an unhealthy ulceration with a sloughy appearance forms upon the summit of the gum; then, say our text-books and writers upon the diseases of infancy,—*then* we may sometimes resort to incision of the gum.

"In forming a diagnosis," says one of the highest authorities, "whether a disease present during the time of teething is consequent upon some derangement of this process, or upon an abnormal condition of some other organ or organs of which the dental difficulty is but itself a symptom, the state of the jaws must be the principal guide. If, in the presence of symptoms which might arise from teething, we find that the teeth are not pressing forward towards the surface of the gums, and that the latter maintain their normal appearance, it will be useless to have recourse to the gum lancet." Young practitioners are cautioned, by a recent writer, not to display their ignorance by the use of the lancet, except the *local* indications imperatively demand it. The local signs, it is to be inferred, are tumefaction, redness, induration, ulceration, and the whiteness of the presenting tooth. The direct pressure upon the fibrous tissue is thus assumed to be the cause of the various and serious complications which are too frequently associated with the period of the primary dentition. It is doubtless true that a hyperæmic condition of the gums may be caused by the growth or eruption of the teeth proceeding more rapidly than does the absorption of their integumental covering, and that the undue pressure thus caused may occasion trouble, by the irritation of the nerves of the gum-tissues,—manifested locally by tumefaction, soreness, redness, or ulceration; systemically, by fever, irritability, sleeplessness, etc. It is also admitted that judicious treatment of pathological dentition should in all cases include hygienic care, and that constitutional medical, as well as local surgical, interference is generally demanded. Nor is it claimed that in the perversion of this physiological process is to be found an explanation of all the ills to which human infancy is heir; but we assume that pain so intense and unremitting as to destroy the appetite for food, to cause wakefulness, irritability, thirst, fever, diarrhœa or constipation, congestion, convulsions, and death, may be due to the irritation of dentition *without the existence of a single local indication.* In other words, that the most serious complications of dentition are not caused by the pressure of the advancing tooth upon the gums, but by the backward pressure of the resisting gums upon the developing and sensitive *pulp*, giving rise to a true toothache, comparable only to that exquisite torture which is experienced in after-life from an exposed and irritated pulp.

If such a condition of things is possible, it will readily be seen that there can be no question as to the extent of the mischief which may result. The association of the fifth pair of nerves, which supplies the dental filaments, with the great sympathetic, so connects the teeth with the entire economy that the pathological bearings of such deranged action may not be limited. That such a condition may exist will be readily understood, if it is remembered that at the period of eruption the roots of the teeth are as yet incomplete; that instead of the conical termination and minute foramen which characterize perfected teeth, the aperture is quite large, and its edges thin and sharp. In estimating, therefore, the amount of constitutional disturbance which may result because of a want of accordance between the eruption of a tooth and the absorption of the superimposed tissues which impede it, we may imagine the sensitive pulp, made up of arteries, veins, and nerves, in a condition of irritation from augmented vascular and nervous action,—a morbid activity of the process of dentition,—followed by determination, stasis, and congestion, producing a hyperæmia sufficient to cause the protrusion of the mass from the incomplete aperture of the root; which, being pressed upon by its thin, sharp edges, is sufficient cause for any amount of constitutional disturbance of which it is possible to conceive.

Under such circumstances it is not difficult to comprehend the inefficacy of any or all hygienic measures; of relaxants and febrifuges; of local emollients and anodynes. It is also easy to understand how the thorough lancing of the gums, over the tooth or teeth thus situated, may, by removal of the pressure, give a relief so immediate and complete that there shall be no room for doubt as to the correctness of the diagnosis.

The *general* indications of what may not inaptly be termed infantile odontalgia are precisely what might *a priori* be expected. The child, at first simply uneasy, becomes by rapid stages fretful, troublesome, peevish, cross, vindictive; cries persistently, or stops crying only to scream; or, if quiet for an instant, will be found to have its thumb or fingers thrust between the jaws, the chewing upon which seems to afford a momentary cessation of anguish, but only momentary. It refuses food, throws down its toys if handed to it, as though in a passion, and is outraged by any attempt to amuse it. To these persistent, unmistakable evidences of irritability are added a flushed face, corrugated brow, compressed lip, intolerance of light, and disturbed, broken sleep, the desire and effort to sleep seeming to be thwarted by fresh accessions of pain, until the little one sinks exhausted into a troubled slumber, but of short duration. Concomitant with these manifestations, or quickly succeeding them, will be some of the various systemic complications, too frequently with fatal ending, and still *no local indication* of the trouble which is consuming the young life.

A case recently under the care of the writer afforded a marked confirmation of these views. A child one year of age, with the four superior and two inferior incisors in position, after three weeks of restlessness, wakefulness, loss of appetite, fever, paroxysms of pain, and rapid emaciation,—all without obvious cause, certainly without the slightest local indication of trouble in the mouth,—was *cured* by free crucial incisions over the molar teeth, the improvement being so evidently the result of the operation that the relation of cause and effect was plainly recognized by every member of the family. Such cases are not exceptional, and suggest a more careful investigation of the developmental processes of dentition in otherwise unexplainable diseases of infancy.—*James W. White, M.D., in Phil. Med. Times.*

DENTITION.— * * * About three per cent. of the infant mortality of Massachusetts is attributed directly to dentition. Probably many deaths from other diseases are owing to it indirectly. It seems strange that a physiological process should be the occasion of so much loss of life, and physicians of high standing are not wanting who deny that dentition exerts any special influence in the etiology of children's diseases, considering the supposed cases of this influence to be mere coincidences. Undoubtedly some have rated it too highly, but it appears well established that the child, during dentition, is more obnoxious than at other times to inflammatory affections of the nervous, respiratory, and digestive systems.

The influence of dentition in the production of bowel diseases has probably been over-estimated, for this reason, that the follicles of the intestines are developing at the same time that the eruption of the teeth is taking place, and much less powerful exciting causes are necessary to produce diarrhœa than at other times. We also find that teething is more commonly attended with diarrhœa in summer and autumn than in winter. Finally, diarrhœa is a rare accompaniment of dentition in infants reared at the breast.

Convulsions are quite often met with during teething, and are attributed to the undeveloped condition of the brain, whence the spinal nervous system, being without the restraining influence of the will, is excited to reflex action by very slight local irritations, in this case by the pressure of a tooth upon the inflamed gum. This affection, too, occurs mostly in infants fed artificially.

The increased liability of teething children to cephalitis, bronchitis, and pneumonia, is not so easily explained. Vogel, however, perhaps rather fancifully, attributes the bronchitis to the wetting of the clothes over the chest by the saliva, which is so freely secreted at this time. * * * —*J. O. Webster, M. D., before Massachusetts Medical Society; Boston Med. and Surg. Journal.*

The Results of Fruitless Sucking.—The very general habit of fruitless sucking, a term which is meant to convey the mechanical action of the mouth in sucking carried to an abnormal extent or in an abnormal direction, has, up to the present time, not received that attention it demands; and I do not hesitate to say that if parents were better informed of the probable consequences attendant upon this practice they would more frequently check it in their children, and a handsome progeny, instead of "bairns" with mouths like codfish, would be the result.

I have observed no less than seven varieties of it: viz., tongue, lip, thumb, finger, teat, pipe, and blanket sucking, each of which, if carried to excess, has its attendant consequences. With children, thumb-sucking is the most common; the knuckle being pressed against the lower teeth, and the palmar surface of the tip being brought to bear against the backs of the upper teeth, the thumb acts as a double lever, the pressure exerted while the bones are soft and yielding being very great; the result is to press forward the upper alveolus and front teeth while the lower teeth are pressed inwards. Certainly, all cases of projecting upper jaws are not produced in this manner; they are frequently caused by an hereditary excessive development of the alveolus, which is very deep from above downwards in the front of the mouth, and contains extremely long and broad incisor teeth. Another reason I would suggest for the protrusion of the upper incisors is, that in the development of the jaw the intermaxillary portion containing the four front teeth, and the lateral segments carrying the canines on the edge of their surface, are so placed that any retarded or arrested development in the latter would produce this malformation. In the same way I consider cases where the four front teeth seem to lie back to allow the canines and bicuspids to press forward, to be caused by the intermaxillary portion having similarly suffered.

I would now direct your attention to another form, viz., teat-sucking, which consists of moistened sugar tied up in a rag, and given to the infant to keep it quiet; some nurses being in the habit of popping it into the child's mouth whenever it is put into its cot, only to be taken away by stealth when it wakens. Dr. Ballard, in a paper read before the Odontological Society, June 6th, 1864, referred at some length to the injuries effected by this special form of fruitless sucking. He said, "Infants exposed to this form of fruitless sucking are sure to be the subjects of disordered bowels and green stools, and as this is evidence of the stomach and intestines undergoing the peculiar form of softening described by Cruveilhier, etc., it is quite obvious that in proportion to the evil so will their future health and growth be prejudiced. They will also be certain to acquire a retained habit of sucking some portion of their hand or tongue, and then will eventually acquire a deformity of the jaw, which will bear some sort of proportion to the extent of injury which the children have sustained by the habit." His foundation for this statement was an experiment by Dr. Brown-Séquard, who, having a dog with a fistulous opening into the stomach, placed a ligature round the œsophagus, and opened this tube *above* the ligature. The dog was then deprived of food for some time, when the mucous surface of the stomach became dry; in fact all secretion from it ceased. Food was afterwards given, which, under the influence of the state of hunger then existing, was eaten ravenously and swallowed; but, of course, did not reach the stomach as it passed out of the œsophagus above the ligature. The effect of this fruitless eating for a space of two hours was to cause a secretion of a large quantity of gastric juice. Dr. Ballard understood Dr. Brown-Séquard to say it amounted to some pints, which was drawn off by means of a glass tube. From this experiment Dr. Séquard inferred that the excitation of the nerves of taste caused a reflex secretion of gastric juice. Dr. Ballard then saw the analogy between the fruitless eating of the dog and the fruitless sucking of the infant, and caught the idea that gelatiniform softening of the stomach might be the effect of the large secretion of gastric juice; and that the green discharges from the bowels were the evidence of this process going on. Also in a paper read before the Harveian Society, an abstract of which is published in *The Lancet* of April 2d, 1859, Dr. Ballard supported his theory by the fact that animals also suffer from fruitless sucking; for instance, when cows are deprived of their milk for dairy purposes, their calves, owing to the insufficient supply causing fruitless sucking of the teats, are subject to diarrhœa, and death often ensues.

As a mere dentist I cannot in the present company support or in any way criticise Dr. Ballard's views; still I consider it right to mention them, as he is the only member of the medical profession, to my knowledge, who has written about it, and I have tried in vain to obtain any other literature on the subject.

To return to my own more immediate branch, I will relate a case of tongue-sucking under very peculiar circumstances, which came under my notice in this city. A lady consulted me complaining of loss of sleep, caused by being awakened by pain on the left side of the jaws, no pain being felt during the day, and an increasing protrusion of the left upper incisors, which had been going on for some time. On examining her mouth, I found the left upper first molar filled with gold above the enamel level of the masticating surface of its crown, which produced irritation by pressure when the mouth was shut. The pulp of the wisdom was partially exposed, and the left upper second bicuspid wanting, having been extracted years before, and the open space left vacant. On inquiry, I found that, as a child, she was in the habit of sucking the tongue; but she said she thought she had given it up, but told me her child indulged in the practice. My theory was that, as the tongue is naturally directed towards any irritated portion of the mouth, it was brought to bear more upon the left side, owing to the irritation caused by the excess of filling before referred to; and that though tongue-sucking had been given up during the day, probably it was still continued during sleep, by which process the pulp of the wisdom tooth was irritated, so causing the excruciating pain complained of, which gradually subsided, but passed away only to return when the patient again slept. My treatment was to cut away the superfluous gold in the filling of the molar, and as the wisdom was very irregular in position, and for all practical purposes useless, I extracted it, and on examination it was found free from exostosis or periostosis. The result was immediate cessation of pain at night, and in eight months no increase in the protrusion of the incisors, though I would here observe that they have not shown any disposition to return to their normal position, and when I remarked upon this, the last time I saw the patient, she laughed and said she was afraid that when reading or writing she had got into the habit of thrusting her tongue into the gap formed between the central incisors.

Dr. Edwin Morris, of Spalding, in the *British Medical Association Journal* of August 31st, 1871, relates a case of tongue-sucking causing dislocation of the lower jaw in a girl of fifteen, who had indulged in the habit from infancy, and worked away at it so vigorously as to be audible in any part of her sleeping apartment. The action of the pterygoid muscles (which are inserted, one into the internal surface of the angle and ramus of the jaw as high as the dental foramen, the other into the neck of the lower jaw and into the inter-articular fibro-cartilage) together brings the jaw downwards and forwards, projecting the lower teeth beyond the upper. He considered continued action during sleep had preternaturally loosened the ligaments and muscular structures supporting the joint, so as to render them unable to resist violent action during sleep. I wrote to him about this case, and he very kindly informed me that, to prevent a recurrence, a bandage was worn under the chin and over the head, applied continually for some weeks, and for four months only at night. She has now left it off, and the patient from fear, and the practice being checked, has now almost given up the habit.

Many ways have been suggested for the cure of fruitless sucking; among others, I may mention a plate to be worn over the palate with a roughened surface, a blister over the tongue; and forefinger and thumb-sucking, splints to be worn at night on the hand and arm—the application of aloes to the thumb usually sucked.

I may here remark on a case where this plan utterly failed, as the patient in time did not at all object to the bitter taste, and was then provided with a large woolly thumb-stall, that quite answered the purpose which was intended.

Among the more rare forms of fruitless sucking, I would mention the habit some children have of sucking flannel. I know of one case where the child suffered considerably from irritation of the stomach caused by continually sucking and gnawing at the blankets; when this was discovered the sheet and counterpane were stitched together, and the usual retching disappeared without further treatment.

Another very objectionable form, to dentists at all events, is the habit children with projecting jaws have of sucking the under lip, so acting as an opposing pressure to any produced by wearing a regulation frame, to improve matters, for no sooner does the regulation frame come out of the mouth than in goes the lip to counteract any good it may be doing.

Having included pipe-sucking in my list at the commencement of the paper, I must not forget to refer to it, and in the company of so many, who doubtless enjoy the fragrant weed, my remarks shall be brief. The wearing away of the teeth caused by the action of a clay pipe is well known to you all, and I may, perhaps, include epithelioma in the lips of smokers in the list of results of fruitless sucking. I have also frequently seen cases of irregularity of the lateral incisors caused by the continued pressure of the pipe stem.

But though fruitless sucking has undoubtedly its many attendant evils, this most natural habit must surely have its attendant benefits if not carried to the excesses I have alluded to; and I think there is little doubt but that the pressure exerted by the tongue, thumb, finger, or hand, materially assists in the development and expansion of the jaws; for it is an undoubted fact that most of the V-shaped palates and mouths with crowded teeth so often placed under a dentist's care for regulation are found in patients suffering from enlarged tonsils, and whose respiration through the nares is almost an impossibility, so that an open mouth is necessary, and thus the dental arch is allowed to contract without any opposing force.—*Alfred Alex. de Lessert, Esq., in Brit. Jour. of Dental Science.*

Causes of Indigestion.—Next in order, we must remember that imperfect mastication tends remarkably to retard the digestive act, and that both the protein and starchy elements of food are thus affected. The former are imperfectly digested, because introduced into the stomach in a form in which they are only slowly and with difficulty subjected to the action of the gastric juice; and the latter, from the want of the direct effect produced by the saliva, tend to undergo fermentative changes. Hence, as will be seen hereafter, insufficient mastication is a very common cause of irritative dyspepsia, and also of acidity and flatulence. In addition to the frequency with which this form of indigestion is met with in those who eat hastily, it must be mentioned that it tends especially to occur at two different epochs of life—firstly, at the period of the second dentition, when, after children have become accustomed to a mixed diet, perfect mastication is prevented (unless great care be exercised), by the partial loss of the first teeth before they are replaced by the permanent set; and secondly, in old age, when a similar cause comes into operation.

Imperfect changes in the amylaceous substances may also result from diseased states of the salivary glands and of the saliva. It may be sufficient briefly to mention here those cases where, through fistula or otherwise, the supply of saliva is necessarily deficient in quantity; but there are other morbid conditions in which the saliva presents aberrations in quality, which, though the nature of their operation has not been fully elucidated, must, it is believed, exercise an injurious influence on the digestion of the starchy matters of the food. Thus, in some paralytic and irritative conditions of these glands when large quantities are expectorated, as occasionally occurs in the salivation attending pregnancy, and also in the excessive secretion under abnormal stimuli which takes place from the abuse of the habits of smoking and chewing, there is reason to believe, from the similarity of these states to those where excessive secretion has been artificially produced, that its quality may be materially changed.

Changes in the chemical reaction of the saliva must also exercise an important influence on the metamorphosis of starchy matters. The buccal mucus occasionally tends to acquire an acid reaction, and in such circumstances it causes starch rapidly to undergo a series of changes ending in lactic acid. This tendency, which is ordinarily counteracted by the alkaline saliva of the mouth, is, however, liable to ensue when the saliva is acid—a state which has been observed under many different circumstances. It is, moreover, not improbable that other perversions of the salivary secretion may occur, affecting its action on starch, with which we are as yet unacquainted, but of which some indication may be afforded by the observation that the saliva in some cases of dyspepsia has been found deficient in sulphocyanide of potassium.

Further, though foreign to this branch of the subject, it may be noted that the alkaline saliva is one of the most powerful stimuli for the secretion of the gastric juice, and that a deficiency in its quantity, or perversions of the quality of its reaction, are probably not without considerable influence on the proper secretion of the latter of these fluids.—*Fox on Diseases of the Stomach, Med. News and Library.*

Hemorrhage from the Gums.—The following interesting case occurred in the hospital practice of my late brother, Dr. Hyde Salter. He sent me the particulars as I now give them in his own words, accompanied by a sketch of the little mechanical apparatus which he devised and which so successfully accomplished its intended purpose. The patient suffered from a constitutional diathesis of a marked hemorrhagic character, and had several attacks of general bleeding, of which the most severe is here recorded.

"Catherine C., aged about forty-five, of florid complexion, had been liable for many years to bruise visibly on the slightest blow or pressure, and to have black-and-blue patches of various sizes come out without any apparent reason on different parts of her body. On some occasions these patches and spots were so numerous as to be thickly scattered all over her person. They were of two kinds,—small spots and specks of a red or purple color having all the characteristics of true purpura, and larger blue patches from the size of a pea to that of a hen's egg, less defined than the others, and considerably raised above the surface. After remaining for a few days these patches would undergo a change, becoming green and then tawny, and so fading away. On the occasions of these purpurous eruptions, spontaneous hemorrhages would occur from the tongue, gums, fauces, lungs, bowels, etc. On some of these occasions she nearly bled to death.

"On one occasion the bleeding had continued so long and was so unmanageable that I admitted her into the hospital (Charing Cross), fearing that she could not survive above a day or two. The principal bleeding on this occasion, which all efforts had failed to control, was from the gum between the two inferior bicuspid teeth on the right side, where the blood welled up without cessation, and had done so day and night for upwards of a month. I discovered that lateral pressure on the gum, applied with the finger and thumb on the inside and outside of the jaw at this situation, arrested the bleeding as long as the pressure was applied, though the blood immediately flowed again when the pressure was removed. I conceived therefore the idea of producing sustained pressure for an unlimited time by means of a spring which should take the place of the finger and thumb, which the patient might wear in the mouth, and which might arrest the hemorrhage for so long a time that it might ultimately be removed without its recurrence. This was easily managed by placing over the teeth at the seat of the hemorrhage a little steel spring, bent in a horse-shoe shape, the opening between the extremities of which was a little narrower than the distance between the inner and outer aspects of the gum. When applied it was found to exercise considerable pressure and completely to arrest the bleeding. It was put on about five o'clock in the evening and the patient wore it all night, but in the morning the pressure it produced caused such pain and swelling of the gum that it could no longer be borne. When removed, however, no bleeding returned, the explanation of which I have no doubt was, that the little clip had left its equivalent behind it in the tension of the swollen gum—the extrinsic pressure of the spring had been succeeded by the intrinsic pressure of the swelling. The cure was final and complete. The poor woman is living at the present time, and has never had so alarming a return of the hemorrhage since."—*S. J. A. Salter, Esq., M.B., F.R.S., in British Journal of Dental Science.*

ERGOTINE; ITS USE SUBCUTANEOUSLY IN HEMORRHAGE.—Dr. Drasche believes that ergotine must be regarded as the best of all hæmostatic agents for hypodermic use. On two persons, in robust health, the injection of from one-half grain to two grains was uniformly followed by a diminution in the pulse of from four to six beats, and the sphygmograph showed a simultaneous contraction of the calibre of the vessels. The temperature was slightly raised, respiration normal, no influence upon the urine, and the health was quite undisturbed. Some local irritation was caused, but usually passed away soon. Dr. Drasche has employed this method chiefly in tubercular hæmoptysis in doses of one-half to one and a half grains, and in most of the cases the efficacy of the ergotine was very prompt when other hæmostatics had previously been tried without success; in others, although less speedy, it was still successful, and in one case only out of nine did it fail. In two cases of epistaxis the effect was very speedy, and the dose required very small. It has also been used with marked advantage in hæmatemesis, intestinal hemorrhage, and hemorrhagic scorbutus. The best vehicle is glycerin, containing five grains in one drachm, and the injection is best made in the region of the pectoral muscles. When the injections have been long continued, or have been too strong, tingling of the finger-ends and cramps of the hands have been sometimes complained of.—*Wien Med. Wochenschr.; Med. Times and Gazette.*

CHRONIC ODONTALGIA CURED BY QUININE.—Matilda W., aged seventeen, a domestic servant, was admitted on November 1st, 1872. For three months she had had very severe pain in the teeth. At first those of the upper jaw were mostly affected. During the three weeks preceding her admission, the pain had been confined to the left half of the lower jaw. The pain always precluded all hope of sleep if it came on in the evening. The teeth were very defective in the upper jaw. On the right side all but the incisors were wanting; on the left the first bicuspid and first molar were absent. In the lower jaw, on the right half the first and second molar, and on the left half the second molar, were wanting. All that remained of the other teeth were simple stumps, much decayed and discolored. The general health of the patient had been pretty good; the various functions were well performed. She was ordered to take at once a draught containing twenty grains of sulphate of quinine, with dilute sulphuric acid, in an ounce of water. The draught produced cinchonism, with speedy and great relief to the pain, which in the course of thirty-six hours had entirely subsided. She remained as a patient for a fortnight, when she was discharged, having taken no other medicines, and having had no return of the pain.

Dr. Wade drew the attention of the students to the success of the treatment in this case, and stated that a sufficiently large dose of quinine will almost invariably cure odontalgia, even when the teeth are destroyed to so great an extent as they were in this case. Over odontalgia caused by inflammation, or abscess at the extremity of a fang, quinine exerts no influence. The dose required to remove the pain and produce cinchonism varies considerably from fifteen to thirty grains; and it is worth notice that, whereas a sufficiently large dose will cure the odontalgia, an insufficient one, although a large dose, will not alleviate the pain at all.—*Clinic Birmingham General Hospital : British Med. Jour.*

STAGES OF ANÆSTHESIA.—Practical surgeons are familiar with three if not four "stages" in the process or progress of rendering patients insensible to pain for surgical operations. Two stages of excitement, probably cerebral and spinal; two stages cerebral and ganglionic, evidently depressant. Thus, an otherwise quiet man will suddenly burst with the strength of six men out of bed in the earlier excitement stage; a vigorously acting uterus will as suddenly lose all action in the later or third stage. These stages, no doubt, follow one another insensibly and quickly where the anæsthetic is continued in the ordinary doses. One sees them under all anæsthetics and under every variety of inhaler.

Three essential stages,—and as to their progression quickly or slowly will the anæsthetist measure the quantity of the ether or chloroform necessary. Some subjects are struck down almost at once; others, as hysteric women, resisting it. Three stages,—one of excitation, the heart oscillating, as it were, in a balance uncertain; a puzzle to outsiders, but to the man of skill only following the changes of the respiration regularized by it, especially as through the second into the third stage the circulation becomes slow, and pulse may even disappear, and is slow too as a consequence; but there is no fear if the man is not trusting to mechanic stop-watches or inhalers.

It is well to remember that no two patients inhale chloroform or ether, or nitrous oxide gas, alike; each case is a half-physiological, half-practical, little problem by itself, where the true expert is watching these varying changes of respiration and facial expression,—the natural progression of the stages. This healthy oscillating of the heart and lungs, with an eye-out for sickness and vomiting; nor will he neglect these, trusting to something mechanical, like the bow of Ulysses in the classics, so like the chloroform balloons, double valves, bellows, etc., that no one else can bend or make use of except the instrument-maker himself.—*Dr. Kidd, Braithwaite's Retrospect.*

EXOSTOSIS—The subject of exostosis has difficulties which most practitioners have encountered. I do not mean to hint that it is difficult to diagnose a case of exostosis: that is a very simple matter. The questionable tooth has only to be drawn and examined? But if a diagnosis must be effected while the tooth yet retains its position in the alveolus, the aspect of the case is entirely changed. What was easy before may now prove one of the most perplexing and obstinate problems that the practitioner will encounter. We know that the patient suffers, and we are able to get descriptions of his pains, which though graphic are yet confused; if replete with detail, are yet contradictory. I have desired to call attention to this affection, and particularly to special points connected with it.

In hastily writing the following questions, I have aimed to arouse thought and investigation among young practitioners. I have often thrown the interrogation into illogical forms, and purposely given a mistaken bias. I hope practitioners will communicate to the *Register* their experience in treating this disease.

If we define exostosis to be an extension of ossific tissue by the addition of new matter upon its surface or within its substance, is our definition likely to be confounded with normal growth or with other forms of morbid growth?

To what forms of pathological tumefaction are the hard tissues subject that are liable to be mistaken for exostosis?

In dental exostosis, is the production of the new structure preceded by the formation of soft cartilage, into which the phosphates are deposited? Is the new tissue a deposit upon the surface of the old, or is it an expansion of all parts of the old as a seeming result of the development and proliferation of the elementary parts? In hypertrophy of the cement, is the nutritive matter necessary to the increase of the part passed from the pulp through the dentinal tubuli, or is it furnished by the periosteum?

It has been said that a continued irritation of the periosteum accompanies hypertrophy of the cement. Is this irritation always a concomitant symptom, and does it precede or follow the earliest hyperossific deposit?

Was the observation of Thomas Bell, that the added substance in dental exostosis is "harder, yellowish, and slightly transparent (translucent)", ever confirmed by subsequent investigators? If so, does the dentine in exostosed teeth share in this increased density, translucency, and color? Are other teeth in the same mouth usually well calcified, or is an exostosed tooth occasionally found among other teeth whose tissues have been starved for want of mineral substances?

Does the nodulated or warty variety of exostosis depend upon the same or similar causes as the cap-shaped variety, in which the hypertrophied cement, covering the whole root, thins towards the neck of the tooth?

Does exostosis depend upon constitutional conditions in any such manner as to associate it with calcification of the pulp? Are the two affections frequently found together? If so, are there any other concomitant circumstances which we may safely set down as connected with them both; such as peculiar temperaments, special diathesis, or particular habits as regards food and exercise, or marked systemic tendencies? Do age or sex exert a modifying influence on diagnosis as regards frequency of presentation or severity of cases?

Why does exostosis occur most often in bicuspids and molars? Do additions to the cement occur after the pulp is devitalized?

Do we often find exostosed teeth sensitive to percussion, painful to thermal changes, or affected with inflammation of the pulp? When exostosis is complicated with exposure of the pulp, or with sensitive dentine, how may the symptoms of these three separate affections be discriminated and traced each to its own proper cause? In what manner may we distinguish the neuralgia which arises from the lesion of a nerve from that which is due to exostosis?—*D. C. H., in Dental Register?*

OXYCHLORIDE.—Oxychloride of zinc for capping nerves is beyond doubt the best material that can be used. In fact, in most cases I consider it almost infallible, and when properly used there can be but few failures. It should be applied in a very thin, batter-like condition, so that it may cover the exposed nerve without the least pressure. To apply it, I would advise the use of the rubber dam in every case where it can be used. Put on the dam, properly prepare the cavity by removing all carious dentine, and in order not to wound the nerve while cutting immediately around and over it, use a broad, sharp excavator, so that if you should cut the nerve it will not be lacerated as with a dull instrument. If you have exposed the nerve by excavating, and it has never given pain, apply the oxychloride without any other application whatever, unless there should be severe pain; then you may apply chloroform, which will generally give immediate relief. Give the oxychloride ten to fifteen minutes to set, while you may be preparing your foil, etc. So soon as the zinc has had sufficient time to set, cut away all surplus; then proceed with the filling at once. An oxychloride capping should be kept dry till covered with the gold. There are many teeth lost by capping to-day with a promise of filling to-morrow, or at some future time. In no case would I wait for results before filling, as by filling at once you make your own results, and successful. A failure under this treatment I never look for. I have in two cases recently removed fillings that I had put in over capped nerves, and in both cases found the nerve in a perfectly healthy condition. In one case the filling had been in over one year, and in the other nearly four years. My reason for removing and refilling was that I found the fillings defective. In cases where the tooth has been aching from coming in contact with heat or cold, apply carbolic acid, dry out, cap, and fill as before. If there should be considerable inflammation in the nerve, treat until you restore to perfect health, which in some cases may take a month or more. Never fill so long as there is any soreness in the tooth, but in all cases fill immediately after capping, as the filling gives greater protection to the tender nerve.—*J. C. Goodrich, in Missouri Dental Journal.*

LOCAL EMPLOYMENT OF CHLORATE OF POTASH IN CANCEROUS SORES.—In the *Berl. Klin. Wochenschrift*, No. 6, 1873, Dr. Burrow, of Konigsberg, advocates the local employment of chlorate of potash in the treatment of cancerous sores. His proceeding consists in sprinkling the sore with chlorate of potash in powder or crystals, and covering the whole with a wet compress. As the crystals of chlorate of potash exert a more powerful action than the powder, and excite greater pain, Dr. Burrow uses the powder first, and replaces it by the crystals when sensibility has been abated. One of the cases was a cancerous sore of the left arm, which healed completely after eight weeks' treatment. Three other cases were cancerous sores of the breast; one was lost sight of, the other two are under treatment, and healing well. The fifth case recorded was connected with a cancer which originated in the periosteum of the upper jaw and left cheek-bone, and then became ulcerated; in this case healing was complete in three months. *Nashville Journal of Medicine and Surgery,* July, 1873, and *Journal of Materia Medica,* August, 1873.

MECHANICAL DENTISTRY.— * * * It is believed that nothing has occurred since the last meeting of the Illinois Association to change the views of any member on the resolution then unanimously passed, that the good of both dentists and patrons would be promoted by a general abandonment of rubber and a return to the use of metal plates. I have observed with care the effects of wearing rubber next to the mucous membrane in all the cases that have presented; and in nearly all there was a turgidity of the vessels of the membrane indicative of irritation or of heat, which is not seen where metal plates are worn. Chronic nasal catarrh has made its appearance in several persons coincident with the wearing of rubber plates, and further investigation may demonstrate that the one was the cause of the other. It may be well for all dentists to scrutinize closely the condition of all mouths in which rubber is worn, and we can learn in time to what extent it is deleterious. Without pretending to give satisfactory reason for the fact, it is a matter of observation that absorption goes on much more rapidly under a rubber than a metal plate, and the adhesion is consequently sooner lost. This fact, making it necessary to renew the teeth quite often, may be a sufficient argument with economical people to persuade them to choose gold, as being equally cheap when the expense is spread over a long period of time.—*D. A. W. French, in American Journal of Dental Science.*

DEEP AIR CHAMBERS.—In the construction of artificial dentures it has become the almost universal custom to make use of air chambers. But however good the principle may be on which it is founded, it is subject to great abuses which call loudly for correction. We opine that many have never given the subject a moment's reflection, never sought to ascertain the principle, mechanical or otherwise, on which it is established, or what its results are, save in a single direction, viz. a tight-fitting plate. A plate formed with a deep air chamber, no matter how illy constructed, is their *ne plus ultra,* and is expected to overcome all muscular movement, combined with gravitation and all other forces that may be brought to bear against it. It is a misnomer to designate this cavity an air chamber, when in fact it is a vacuum chamber, and produces its results on the principle of a vacuum. But its result, not its name, is our object.

Having stated the object of the air chamber, and noted the principle on which it acts, we are prepared to consider results. In its normal condition, we find the palatine surface, or roof of the mouth, void of all inflammation, its general surface even, and characterized by the absence of any marked protuberance. Slight depressions often exist, and not unfrequently a narrow sulcus may be found occupying the mesial line, extending well back towards the soft palate. The anterior surface is more or less rugous. Does not reason and common sense teach us that these parts should remain as nature formed them? In the construction of an artificial denture should we not bear in mind the nature of the parts to be brought in apposition, not forgetting the fact that one is non-vital, hard, and unyielding, and the other vital to the first degree, highly organized, and very yielding, upon which the former stamps its shape even to the minutest line? Considering these facts we are not surprised at what follows when deep chambers are used. A plate containing one is inserted in the mouth when the tissues are in a normal condition. After it has been worn a year or two, upon an examination of the mouth, a huge excrescence—we can compare it to nothing else—is found depending from the hard palate, often in a high state of inflammation. The reason is evident. Nature has asserted her immutable law; the weaker has given way to the stronger, and in obedience to this law and the law of atmospheric pressure, the soft tissues have taken on an abnormal growth, enlarged, and have stamped on themselves the exact counterpart of the deep chamber,—a strong proof of its evil results and the folly of its construction. No such result follows the use of a shallow chamber. When moulded or cast bases are used, deep chambers require an extra thickness of plate, and in consequence an increase of material and weight, both of which should be avoided for obvious reasons. To secure the best results, let the plate be as thin as the proper strength will admit of; the chamber, when one is used, shallow, large rather than deep, in the proper position, not encroaching on the ruga, with well-defined edges,—not rounded,—of the proper shape to accommodate the parts over which it rests, and the result will be all that could be expected, with all the good and none of the evil results of the deep chamber.—*W. H. Barker, in Mo. Dental Journal.*

ARTIFICIAL CROWNS.—* * * * I have practiced the following method for some time, and as it has given every assurance of success, and I have heard of no failures, I will proceed to state it; however, without claiming anything especially original or novel, we will take it for granted that the root has been properly treated, and the apex and part of the nerve cavity thoroughly filled, and the adjacent parts free from inflammation. The root having been prepared by filling, etc., an ordinary pivot tooth is then selected, and properly fitted. A pivot should then be made of heavy gold plate by forming a tube, being careful, however, not to bring the edges entirely together. This should fit the pivot hole tightly, but without compressing the sides of the tube sufficient to bring the edges together. The metallic pivot is then placed in the tooth and applied to the root, being of the proper length, etc.; the pivot is then secured in the pivot tooth with gum shellac melted over a spirit-lamp. The tooth and pivot are then secured in a notch cut in a small piece of soft wood by a thin paste of "Guillois's Cement." By passing the stick armed with the tooth through the flame of the lamp several times, the setting of the cement will be greatly hastened. A napkin is then placed over the lips, and the cavity in the roots having been thoroughly dried with the hot air syringe is then partially filled with powdered shellac. The wooden shaft is then taken up, and the tooth and pivot warmed over the flame until they have become warm enough to melt the gum; when the tooth can be forced home with a few light taps of the mallet on the end of the wooden shaft. A few drops of water from the syringe will chill the shellac, and the tooth will be firmly anchored.

The reason why the edges of the metallic tube should not be brought together is, that the expansion of the metal when heated would burst the tooth. The advantage of this method is its simplicity and permanency. It is a well-known fact that shellac is insoluble in water, or even dilute alcohol, consequently the fluids of the mouth have no perceptible effect upon it.—*B. O. Doyle, in Dental Register.*

Dissecting Alveolar Abscess.—Under this title may be described a simple though instructive case, occurring in the out-patient practice of University College Hospital.

A young woman, about twenty-five years old, presented herself with a swelling on the hard palate, about two inches long and three-quarters wide, limited behind by the palato-maxillary suture, and extending forwards to about the apex of the lateral incisor root, and mesially by the maxillary suture.

Fluctuation being very evident, a free incision was made at the posterior extremity, which, rather curiously, was the most distended and depending, a free discharge of pus followed, and on a probe being passed into the opening, there was distinct evidence of bare bone, showing that the periosteum had been stripped from the palatine process of the left superior maxillary bone.

A week afterwards the opening made had entirely healed. On this occasion it was noticed that the root of the left superior lateral was all that remained of the tooth, and was in a necrosed condition, though not loose, but almost black. The patient was directed to attend Mr. Ibbetson's practice, when the root was removed, and on her next visit, three days afterwards, the swelling was greatly reduced, though the natural conformation of the parts was not quite restored.—*S. J. Hutchinson, L.D.S., in Monthly Review of Dental Surgery.*

Transverse Fracture of a Central Incisor.—In the spring of 1871 a gentleman called at my office with his little girl eight years of age, who, while swinging on the door yard gate, received a blow of such force against the gate post as to loosen (as he said) one of the central incisors, and desired to know if anything could be done to save it. After due examination, I became satisfied it was a transverse fracture just above the alveolar border, instead of a loosening, for on applying lateral pressure the feel was very different from what I would expect of a loosened tooth, inasmuch as the motion seemed much shorter, and I could distinguish a grating feeling uncommon in the other case.

Furthermore, the crown was one-fourth its length longer than its mate, quite loose, but not painful, except to upward pressure, when it was unbearable, indicating nerve irritation. I gave some soothing wash, remarking this was about all I could do, and thought she would have to lose it, though nature might effect a cure, but I had never seen the record of a similar case, and much would depend upon the absence of irritation to the pulp.

He thought it worthy of trial, not wishing to make the sacrifice, while I cautioned them to use this tooth as tenderly as possible.

Saw her several times during the month following, and could see no material change, except that to upward pressure the soreness was gradually receding—owing, as I thought, possibly to pulp death.

Six months later the tooth was as firm as its mate, retaining its length as before stated.

Saw it again during the past week; condition remains the same, without the slightest discoloration indicating death of the pulp.

The point of interest to me in this case is, regarding the supply of new material for the repair in this emergency, and I think nature has done in this case precisely what she does in fractured bones in other parts of the body, and I may say is ever able to do, provided the good result sought could be influenced by the age and health of the patient, as well as rest from mastication.

Who will write the record of a similar experience in this direction?—*D. B. Freeman, in Missouri Dental Journal.*

Spontaneous or Chemical Abrasion.—With this cursory description of the disease, we proceed to a consideration of its treatment.

1st. Can anything be done to prevent it?

2d. Can anything be done to arrest its progress?

Harris, under the head of "Treatment," says: "This, like some other affections of the teeth, cannot be cured," etc. But with our present knowledge of the disease we can usually, at least, arrest its progress. The immediate cause, as we have seen, is the action of acids, principally; and by protecting the cutting edges from these influences, its progress is at once stayed. This is done by completely covering the surfaces with gold. This, as a general thing, is not a very difficult operation; and operations of this character are very frequently resorted to for this purpose. A small drill is first carried down just at the junction of the enamel with the dentine, into the cutting surface of the tooth about one-third of a line; then place in the engine a fine bur shaped like a truncated cone, the base of the cone at the end of the instrument. Insert this into the cavity formed by the drill, and carry it steadily along the margin of the enamel, where it rests against the outer surface of the dentine, until it describes the whole circuit of the cutting edge of the tooth. A groove will then have been cut around the central portion of the cutting or grinding surface, whilst that portion which marks the deepest portion of the concavity and which is directly over the pulp will remain intact. The groove will necessarily be somewhat broader at its deepest part than at the surface, and a filling inserted into the groove will be firmly held in place; and the gold can easily be extended from it over the central portion and also over the abraded enamel, and the whole should then be carefully built up, as far as may be desired. In cases where these carious cavities are upon the proximal surfaces, these should be connected, as a general thing, with the central filling, and in this way the destructive process is completely arrested. In some cases it may be necessary to insert screws to make the fillings perfectly secure, and in some cases the cutting edge is too thin to leave a central portion, when it is almost always safer to make use of two or three screws to insure a permanent operation. This is equally efficacious in mechanical abrasion; if resorted to early, upon the first appearance of the mechanical abrasion which precedes the spontaneous variety, it will prevent the subsequent cupping in those teeth which have already lost their enamel covering, and also prevent others from being affected, in the same way. In order to effect this, however, the gold must be raised over the cutting edge sufficiently to receive the friction of the antagonizing teeth upon itself, so that a mechanical wearing away of the surface of other teeth will become impossible. The results of this practice are generally highly satisfactory to both patient and operator, and many dentures are now preserved by this method in a most efficient condition which would otherwise be inevitably destroyed.

We would impress upon the minds of all, however, the importance of attending to these cases early, as the operation, after a considerable number of the teeth are much affected, is tedious, expensive, and in no other cases can we benefit our patients more by prompt and early attention than in these cases of abrasion.—*Dr. H. Judd, in Missouri Dental Journal.*

To Prevent Abrasion of the Cheek from Spiral Springs.—When it is necessary to use spiral springs for the first time, much discomfort is often endured by the patient on account of the chafing produced by them. This may be, in a great measure, prevented or relieved by one or other of the following plans:—Either make a solution in chloroform of pink rubber and paint over the surface of the springs before putting them on the set of teeth, or else obtain some of the very fine and thin elastic rubber tubing which is now made; and, having first passed a brooch up the center of the spring to prevent crippling, draw this tubing over, so that the whole of it is covered except those portions that play against the teeth. In this way these necessary evils may be made tolerable to sensitive mouths by protecting the mucous membrane from their metallic feeling and irritation.—*Coles's Dental Mechanics.*

Glycerin as a Solvent.—M. Klever has published a lengthy table of the solubility of various substances in glycerin, the following abstract of which may be of value to some readers of the "Journal." From his published observations, it appears that one hundred parts, by weight, of glycerin dissolve, at ordinary temperatures:

Parts by Weight.	Substance.	Parts by Weight.	Substance.
20	Arsenious Acid.	0.20	Phosphorus.
20	Arsenic Acid.	20	Plumbi Acetate.
10	Benzoic Acid.	50	Potassium Arsenate.
10	Boric Acid.	3·50	" Chlorate.
15	Oxalic Acid.	25	" Bromide.
50	Tannic Acid.	32	" Cyanide.
40	Alums.	40	" Iodide.
20	Ammonium Carbonate.	8	Acid Sodium Carbonate.
20	" Chloride.	60	Borax.
5·50	Tartar Emetic.	98	Sodium Carbonate.
10	Barium Chloride.	20	" Chlorate.
30	Cupric Sulphate.	0·10	Sulphur.
7.50	Mercuric Chloride.	50	Zinc Chloride.
27	" Cyanide.	35	Zinc Sulphate.
1·9	Iodine.	50	Urea.

Parts by Weight.	Substance.
0·45	Morphine.
0·50	Quinine.
0·25	Strychnine.

—*Journal of Franklin Institute.*

Manufacture of Alloys.—An eminent authority gives the following as reliable directions for the most successful manufacture of alloys:

1. Heat the crucible to a red or sometimes to a white heat, and then melt the least fusible of the metals composing the alloy. After fusion, heat this metal to such a heat that it will bear the addition of the next least fusible metal without too great a reduction of temperature.

2. Introduce the metals into the pot strictly in the order of their resistance to fusion, each metal being properly melted before the next is

added. The danger in first melting one of the most fusible metals lies in the fact that it would most probably volatilize and become oxidized; this would be a source of great waste.

3. Heat each charge of metal thoroughly before adding it to the pot, thus avoiding as far as possible the reduction of the metal in the crucible.

4. When the proportion of zinc is large, and some of the component metals have a high point of fusion, the alloys should be covered with a layer of charcoal dust. If the alloys are rich in tin, the surface of the melted metal should be covered with sand.

5. Stir the metal before casting, and if possible when casting, with a whitewood stick; this is much preferable for the purpose to iron.

6. If possible add a small portion of old alloy to the new one. If the alloy is required to make sharp castings, and strength is not a very great object, this proportion of old alloy to the new should be increased. In all cases a new or thoroughly well cleaned crucible should be used. —*Journal of Applied Chemistry.*

TUMOR OF THE SUPERIOR MAXILLA.—The following notes, supplied to us by Mr. Cripps, house surgeon, are of interest as showing the rapid recovery and little constitutional disturbance following removal of the superior maxillary bone.

H. W——, aged twenty-six, six years ago had a tumor, which was supposed to be myeloid, removed from the right upper jaw. In 1870 the part again became painful at times; and early in the following year she noticed a return of the growth, which had gradually increased in size, and on the 8th of January of this year presented the following appearance:—The right cheek was prominent, giving this side of the face the appearance of a slight general swelling, the eyeball on this side being slightly pushed forward. The upper molar teeth, which were perfectly sound, were somewhat separated from each other, the alveolar border in this portion being considerably hypertrophied. On placing the finger beneath the lip on the front wall of the antrum, a prominent swelling could be felt. The roof of the mouth retained its normal concavity. The patient complained of a constant aching pain, which during the last two months had almost deprived her of sleep.

On January 12th the superior maxillary bone was removed by Mr. Thomas Smith. No ligatures were used, the hemorrhage, which was free, being stopped by dry lint plugs. The external parts were brought together by a continuous horsehair suture, and a couple of harelip pins were used for the lip. She slept several hours on the night of the operation. The lint plugs were removed on the third day. On the eighth day she was out of bed, and left the hospital ten days later.

With the exception that, on the fourth day, the temperature rose to 103.5°, followed by a slight blush round the wound, her temperature never exceeded 101°. On the 3d of April the hole in the palate was about the size of a penny-piece, and the voice was perfectly natural. There was remarkably little deformity, a general want of expression and a slight swelling of the lower eyelid being all that was most apparent. The two incisor teeth on this side were spared in the operation.

On a section being made through the bone, the antrum was found entirely filled by a firm fibrous growth, which had sprung from the floor, to which it was firmly attached. Although in close contact with the sides of the antrum, the tumor was not adherent in any other part;

it had, however, penetrated a short distance into one or two of the canals.—*St. Bartholomew's Hospital Reports; Lancet.*

Foreign Body in the Œsophagus.—Dr. D. E. Smith relates the case of a young married woman, who, during an attack of puerperal convulsions, swallowed a partial set of false teeth, four in number, and fastened with a gold clasp. They remained for three days in the pharynx, which was not examined by the attending physician, who declared it to be impossible that the teeth could have been swallowed. At the end of this time, her ingesta having in the mean while been completely fluid, she ate a small piece of beef-steak, in company with which the teeth passed down the œsophagus to a point near the cardiac orifice, where they were arrested by the hook of the clasp penetrating the œsophageal wall. The patient remained in this condition for three months, gradually growing weaker, and undergoing treatment for indigestion, general debility, incipient phthisis, etc., her physician persistently denying the presence of the teeth. A post-mortem examination disclosed the facts to be as above related.—*New York Medical Review.*

Report your Cases.—Every intelligent member of the profession should feel personally bound to contribute to its advancement. In this direction, the following remarks from Dr. Tilt's address before the Obstetrical Society of London are in point, and should be heeded:

"Every now and then there crop up in everybody's practice 'representative' cases,—cases which well illustrate a mode of treatment, or confirm some theory, or show the fallacy of another. These are the cases we want, and there can be no excuse for not recording them; for although many of you are too busy to write papers, all can carefully note down the particulars of a case, and we ought all of us to bring ourselves to feel it as a crime to let a little trouble interfere with the careful recording of an important case. If we [this Society] did nothing in the course of each year but to well sift a considerable number of such cases, and to issue them, stamped, as it were, with the seal of authority, we should be laboring most efficiently toward the intelligent reconstruction of medicine; for its imperfection undeniably depends on the deplorable inaccuracy with which cases are collected, if one can call cases the shreds and tatters of half-ascertained facts that we so often meet with in medical works."—*Boston Med. and Surg. Journal.*

Amaurosis cured by the Extraction of Fangs.—Miss M., who had resided some time in the neighborhood of Nordhausen, had, in consequence of diminished power of vision in the left eye, consulted a physician, and had been under treatment for some time, but, instead of improving, had entirely lost the sight of the eye, when she consulted me on account of some trouble with her teeth. I extracted first the fang of the left canine tooth which had an abscess at its apex, and afterwards eight other fangs from the upper jaw. The next morning she came joyfully to me with the exclamation, "I can see again." I found that the pupil had regained its normal condition, and that the power of vision was re-established.—*Frühauf, Deutsche Vierteljahrsschrift für Zahnheilkunde.*

Hardening Small Tools.—According to J. Scheuszleder, watchmakers and engravers harden their tools in sealing-wax. The article is made white-hot and thrust into sealing-wax, allowed to remain a moment, then withdrawn and thrust into another place; and this treatment is continued until the steel is cold, and will no more enter the wax. The hardness thus attained is extreme, and comparable to that of the diamond; in fact, steel hardened in this way may be used for boring or engraving steel hardened by other processes, the tool being previously moistened with oil of turpentine.—*Boston Journal of Chemistry.*

Bronzing Small Articles of Iron.—Clean the wire perfectly, and then immerse it in a solution of sulphate of copper (blue vitriol) until covered with a coating of metallic copper. Then wash and immerse the articles in the following solution: Verdigris 2 ounces, sal ammoniac 1 ounce, vinegar 1 pint, diluted with water until it tastes only slightly metallic, then boiled for a few minutes and filtered. The articles of wire are steeped in this liquor at the boiling point, until the desired effect is produced; but do not keep them in too long. When taken out, wash carefully in hot water and dry.—*Scientific American.*

How to Solder Broken Files.—They can be soldered with a common spirit lamp and blowpipe with common tinner's solder, after first cleaning the broken parts with muriate of zinc.—*Scientific American.*

Shaping Soft Rubber with a File —President Morton, of the Stevens Institute, states that he finds the ordinary thick sheet rubber, used in making up lantern tanks, and for many similar purposes, may be readily dressed into exact shape *with a file*, if only it is supported by being clamped between plates of wood or metal in the vise. The file is used dry, and in all respects as in working on wood or metal.—*Boston Journal of Chemistry.*

A Good Cement.—A very adhesive cement, and one particularly useful for fastening brass on glass, may be prepared by boiling three parts of resin with one part of caustic soda and five parts of water, thus making a kind of soap, which is mixed with one-half its weight of plaster of Paris. Zinc white, white lead, or precipitated chalk may be used instead of the plaster, but when they are used the cement will be longer in hardening.—*Boston Journal of Chemistry.*

Waterproof Glue.—Bichromate of potassa has the property of rendering insoluble, under the influence of light, certain organic bodies, such as gum, glue, glycerin, etc. If a paper covered with gum mixed with bichromate is exposed to light, the coating becomes quite insoluble even in boiling water. This property is utilized in the so-called "carbon" photographic process. Strong glue becomes insoluble more rapidly than gum, and the action takes place slowly even in the dark. A concentrated solution of bichromate is prepared, which is kept in the dark, and a little of which is added to boiled gelatin. Objects glued with this after some time can be washed either with cold or hot water.—*Chemical News.*

Anti-Neuralgic Snuff.—The *Rivista Clinica di Bologna* mentions an anti-neuralgic snuff prescribed with success in cases of facial neuralgia, by Dr. Scriffignana. The base of the snuff is quinine, and its composition as follows: Citrate of quinine, ten grains; very strong exciting snuff (tobacco), fifteen grains. The medicament is said to act almost directly on the diseased nerve through the ethmoidal thread of the nasal ramus of Willis's ophthalmic, a branch of the fifth pair.—*London Lancet.*

TREATMENT OF NARCOSIS OF CHLOROFORM (*Bulletin Generale Therapeutique*, April 15th, 1873).—According to Dr. Baillée, there is no more energetic means of overcoming the narcosis produced by chloroform than the introduction of a small piece of ice into the rectum. It can be pushed through the sphincter without the employment of much force. It immediately melts, producing a deep inspiration, which is the precursor of natural respiration and the re-establishment of cardiac functions. He recommends the same plan to be pursued in cases of apparent death in new-born infants.—*Phila. Med. Times.*

NATURE OF MUMPS.—In a note on the above, read to the Academy of Sciences by Claude Bernard, the author, Dr. Bouchut, states that parotitis is simply a salivary retention due to catarrhal inflammation of the excreting canal of the parotid.—*London Lancet.*

THE DIPLOMA IN DENTAL SURGERY OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—*Education.*—Candidates are required to produce the following certificates: Of being twenty-one years of age. Of having been engaged during four years in the acquirement of professional knowledge. Of having attended, at a school or schools recognized by this College, not less than one of each of the following courses of lectures, delivered by lecturers recognized by this College—namely, Anatomy, Physiology, Surgery, Medicine, Chemistry, and Materia Medica. Of having attended a second winter course of lectures on Anatomy, or a course of not less than twenty lectures on the Anatomy of the Head and Neck, delivered by lecturers recognized by this College. Of having performed Dissections at a recognized school during not less than nine months. Of having completed a course of Chemical Manipulation, under the superintendence of a teacher or lecturer recognized by this College. Of having attended, at a recognized hospital or hospitals in the United Kingdom, the Practice of Surgery and Clinical Lectures on Surgery during two winter sessions. Of having attended, at a recognized school, two courses of lectures upon each of the following subjects—namely, Dental Anatomy and Physiology (Human and Comparative), Dental Surgery, Dental Mechanics, and one course of lectures on Metallurgy, by lecturers recognized by this College. Of having been engaged, during a period of not less than three years, in acquiring a practical familiarity with the details of Mechanical Dentistry, under the instruction of a competent practitioner. Of having attended at a recognized dental hospital, or in the dental department of a recognized general hospital, the Practice of Dental Surgery during the period of two years. N.B.—The students of the London schools are required to register the above certificates at this College; and special returns will be required from the provincial schools.

Examination.—The examination is partly written and partly oral. The written examination comprises General Anatomy and Physiology, and General Pathology and Surgery, with especial reference to the practice of the dental profession. The oral practical examination comprises the several subjects included in the curriculum of professional education, and is conducted by the use of preparations, casts, drawings, etc. Members of the College, in the written examinations, will only have to answer those questions set by the section of the Board consisting of persons skilled in dental surgery; and in the oral examination will be examined only by that section. A candidate whose qualifications shall be found insufficient will be referred back to his studies, and will not be admitted to re-examination within the period of six months, unless the Board shall otherwise determine. Examinations will be held in January and June. The fee for the diploma is ten guineas, over and above any stamp duty.—*The Lancet.*

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HINTS AND QUERIES.

CERTAINLY it is excellent discipline for an author to feel that he must say all he has to say in the fewest possible words, or his reader is sure to skip them; and in the plainest possible words, or his reader will certainly misunderstand them. Generally also, a downright fact may be told in a plain way; and we want downright facts at present more than anything else.—RUSKIN.

WHAT is the best local application for the first stage of abscess, when confined to the palatine root?—S. P.

CHLOROFORM proving a failure for a local application to relieve the after-pains of extraction on account of alveolar abscess, what is better?—P. R.

WHY is it that some of the human teeth (most frequently the cuspids) have corrugations or rings around them, similar to the corrugations around the horns of cattle?—D. C.

Is liquid nitrous oxide much used by the dental profession, and with satisfaction?—C. G.

WHAT is the best treatment to arrest the absorption of the gums and alveoli where the teeth are still sound and apparently healthy?—N. B. S.

WILL some one inform me how to bleach English rubber in the absence of sunlight?—Z.

WITH this I send you a dens sapientiæ tooth, united to the second molar by osseous union, which I recently extracted. I am puzzled to know how the germs of those teeth could have united, as the one is supposed to be eight or ten years younger than the other. Will some one explain?—J. J. C.

REPLY TO "DENTAL STUDENT."—Never use arsenic in any case; then you will avoid such effects. Time will remedy the effects on the gum; but if it has attacked the septum, cut away that portion which is dead.—T. G. P.

REPLY TO "N."—"How many pounds pressure of steam is indicated by a degree of the thermometer in a vulcanizer?"

At a temperature of 212° the pressure of steam is estimated to be equivalent to atmospheric pressure, viz., in round numbers, 15 lbs. per square inch. At 250° the pressure is nearly doubled—about 30 lbs. to the inch. At 293° it has nearly four times the pressure it had at 212°, that is, about 60 lbs.,—and at 341° it has nearly eight times the pressure, or about 117 lbs. to the square inch, the ratio of increase being far greater than the increase in temperature.

The following table, from Dr. Wildman's Monograph, *Instructions in Vulcanite*, shows how rapidly the pressure increases at high temperatures:

	Increase of temperature.	Increase of force per square inch.	Giving a force per square inch.
From 212° to 263.84°	= 51.84°	22.05 lbs.	36.75 lbs.
" 363.84° to 414.24°	= 50.40°	44.10 lbs.	80 85 lbs.
" 314.24° to 366.85°	= 52.61°	80.85 lbs.	161.85 lbs.
" 366.85° to 418.46°	= 51.61°	132.15 lbs.	294 lbs.

—W.

In preparing a young lady's mouth for artificial teeth, a week or two since, I found both the "anterior superior bicuspids" with three fangs. The enclosed is one of them. I do not remember ever to have seen such in my twenty-six years' practice. Dr. Tomes describes such in a "Chinese skull."—H.

Pivot Teeth on Gold Pivots.—Having seen several articles in the dental journals describing various methods of setting pivot teeth, I am led to give a description of a plan which is, I believe, at least partially original with me.

After having prepared the root in the ordinary manner, I use a twist drill, corresponding in size with a gold socket having a fine screw thread cut in its outer surface; then countersink the crown end of the root and undercut to retain a foil filling; then screw the socket firmly into the root, and cut it off a little beyond, flush; then fill around it with gold, so that when finished the whole crown end will present a gold surface; then make a gold plate to fit the surface accurately, and having placed a little softened wax upon its crown side, keep it against the end of the root. The impression made by the socket will indicate where to drill a hole, which having done and readjusted the plate in position, I pass a gold wire through it into the socket, retaining it in position with wax or plaster, and removing the plate and it together without disturbing their relative positions; then imbed in plaster and hard solder the two together. I now mount a plate tooth in the ordinary way and solder it to the plate; then insert into the tube already in the root another thin gold tube which accurately fits it, and into which the gold wire or pivot fits. Unless this second tube should be long enough to prevent its being pushed up by the introduction of the pivot, I countersink it with a bur; then slip the pivot into the socket, and it is as firm as though it had grown there. The object of the second socket is to have room in the first to obtain the proper direction of the pivot, which is essential to success

I have employed this method in fourteen cases within a year, and with entire satisfaction to myself and patients.—T. S. Phillips, *Buffalo, N. Y.*

Impressions for Partial Cases.—Better than either plaster or wax alone for some cases I have found a combination of the two; placing a spoonful of plaster in the roof of the mouth, scoring the surface, and then taking the balance of the impression in wax; the plaster and wax coming away together, and giving me a more perfect impression than I can procure with plaster or wax alone.—G. H. C.

Neuralgia as the result of Galvanic Action.—Having had occasion to treat some cases of neuralgia as the result of galvanic action, both in North and in South America, I have decided to report one that I think of practical importance to the student and practitioner of dentistry.

Miss T., aged twenty-six, presented herself at my office November 16th, 1872, for the extraction of the right superior first molar. An examination of the tooth in question proved it to be perfectly sound, and therefore I declined extracting it before learning the cause that induced my patient to apply for extraction.

She said that six months previous to her appearance at my office she had been subject almost every day to severe paroxysmal pains along the whole right side of her face, often being so excruciating that she had to call on a physician, who, after having submitted her to treatment, had been entirely unsuccessful in his attempts to afford her any relief. He had now advised her to consult a good dentist and have the tooth alluded to extracted, as it was the one thought to be the cause of the neuralgia.

Having thus obtained the history of the case before me, I proceeded to examine very carefully every tooth in her mouth, and as they all appeared to be perfectly sound, the only clue that I could find to the disease was that the right superior cuspid had an extensive gold filling, and that it had all the signs of a dead tooth. This fact induced me to remove the filling, when I found, to my utter astonishment, that the cavity of decay had been half filled with amalgam and finished with gold. On account of a deficiency of the filling, a portion of the amalgam under the gold was in constant contact with the fluids of the mouth, thus giving rise to the disease.

The removal of the amalgam gold filling gave instant relief to the patient. I then treated as in ordinary cases of dead pulp, and twenty days subsequently I put in a permanent filling of gold. I saw her last ten days ago, and am happy to say she is enjoying most perfect health.—DR. SERGIO MARIO ROSELLON, *Santa Martha, Colombia, S. A.*

REMOVING IMPRESSIONS.—For the past fifteen years, I have been in the habit of following a certain process for removing impressions from the mouth, which has given entire satisfaction in all ordinary cases, and as I have never known of any one using it beside myself, and have never seen it suggested in any dental book or periodical, I propose giving it for the benefit of any who may desire to try it. In the first place, I make a small hole in the bottom of my impression cup. I fill my cup in the ordinary way with wax, and with a suitable instrument I make a hole through the wax, directing my instrument so that it will pass out about the center of where I wish my air chamber. I have ready about six inches of small cord, well waxed; this I pass through the wax, letting it project about a quarter of an inch, and I press the wax around it to hold it in position while I am introducing the cup in the mouth, and I withdraw it as soon as I wish to remove the impression, which will drop of its own weight, if for an upper set. I pursue the same plan for removing partial or lower sets, and in using plaster, only I put the cord through the cup, and place the plaster around it, taking care that the end of the cord is above the plaster.—CHAS. R. REUCHER, *Enterprise, Miss.*

THE REPLANTING OF TEETH.—Patient, a young gentleman about seventeen years of age; the tooth, a left superior incisor, had been for three years ulcerated. The crown was a mere shell, and so frail that on the day previous to that of the experiment I partly filled the crown cavity with amalgam, in order to prevent crushing it by the operation of extraction. I carefully extracted the tooth, and cleaned the root and socket; removed the sac and the amalgam filling, and drilled directly through the root-canal until I reached the cavity. I then filled this canal and lined this cavity in the crown with oxychloride of zinc filling. Whilst this filling was hardening, I inserted two approximal fillings in adjoining teeth, then very carefully filled the extracted tooth with gold, being particular not to let the oxychloride lining come very near the edge of the cavity. At the expiration of *two hours and forty-five minutes*, I replanted the tooth, securing it in the usual way. For a few hours afterwards there was a dull aching pain, followed by some soreness, which lasted from six to eight days, but daily decreasing in amount. This was succeeded by a feeling of numbness, which lasted about two weeks, but the operation was not so severe as to cause the patient to lose a single meal, or to absent himself a day from school. The operation was performed in April last, and no inconvenience other than above stated has been experienced. To-day I have carefully examined the tooth and its surroundings, and I find no tooth in my patient's mouth more perfect and useful. In my opinion many teeth, by this treatment, may be saved at less expense of time and pain than by any other process.—JOHN M. COMEGYS, M.D., *St. Albans*, *Vt.*

REPLANTATION—A CASE IN PRACTICE.—This case presented itself to me in the person of Mr. David G., aged about thirty-two, on the 20th of August, who complained of severe periodic pains in right inferior lateral. Upon examination I found the tooth abraded by attrition almost to pulp cavity, and tooth slightly sore on tapping, but perfectly sound. I diagnosed dead pulp, and first symptoms of periostitis, yet possibly it might prove to be exostosis. I proceeded to open into pulp chamber with small drill from center of abraded surface, and finding no life, continued with drill in straight line with apex until reaching the latter; found but little pus in canal, enlarged it, and syringed thoroughly with solution carbolic acid, leaving it open, with instructions to call in two days; at which time he came complaining of same pains, sleepless nights, etc. Cleansed and forced into canal and through apex strong carbolic acid, gently closing canal with cotton. Called next day with no abatement of trouble, and wished it extracted. I opposed extraction, counselled patience and another trial; treated thoroughly with carbolic acid and iodine internally, and locally with ethereal solution iodine, and with the cessation of pain dismissed him to call in two days Came next day with increased pains, and determination to have it extracted. Could not prevail upon further treatment, and reluctantly applied the forceps, after suggesting replantation, and gaining his consent, though more on account of the novelty than from any weightier reasons. The pain immediately ceased. I found that my drill had perforated to apex; found no exostosis nor abscess. I immediately excised with a fine saw, about the sixteenth part of its length at apex, cleansed with solution carbolic acid, filled canal from end to end with Guillois's cement; cleansed socket with weak carbolic acid and tepid water; reinserted tooth, applying silk ligatures to each adjoining tooth, all accompanied with but little pain; prescribed a mild tonic wash, and dismissed him to call in two days if no worse. He did so, found some soreness, and tooth slightly elongated. I forced it down, and ligatured to three adjoining teeth on either side. It allowed perfect antagonism without pain. Soreness continued to abate, and no recurrence of pain. Saw patient again September 10th. Tooth firm, no elongation; no soreness; removed ligatures, and now after a month it is doing well, and indicates years it may be of future service. This adds another case of successful replantation, and the third in my practice.—CHARLES A. P. GARNSEY, *Evanston*, *Ill.*

A CASE OF REPLANTATION.—As cases where teeth have been replanted are comparatively rare, I suppose all such successful operations are of interest; and so I send you an account of one which recently came to my notice.

Mr. F. called upon me to have a carious inferior first molar removed. As he refused to have it treated and filled, I extracted it. Owing to the peculiar flaring construction of its roots, the adjoining bicuspid was also forced from its socket. After the pain from extraction had somewhat subsided, the blood was syringed away and the bicuspid replaced. Then, painting the parts in tincture of iodine, I instructed him to report next day.

At the next visit he complained of quite severe neuralgia in the region of the ophthalmic division of the fifth pair of nerves. I directed him to use mustard on the back of the neck, and a hot foot-bath; painted with iodine.

The third day there was no neuralgia, and very little soreness of the tooth. A slight swelling of the face was the principal inconvenience complained of. The surrounding parts were painted daily with iodine for one week. At the end of that time it was of equal service with the others, and occasioned him no inconvenience whatever. The reason of the rapidity with which this tooth resumed its normal healthy tone, I believe to be greatly due to the fact that it was immediately replaced without any previous preparation.—W. E. PINKHAM, D.D.S.

IRON RETORTS FOR MAKING PROTOXIDE OF NITROGEN GAS.—Nitrous oxide for dental operations has now come into general use, and all dentists making their own nitrous oxide must have doubtless met with great difficulties in consequence of the breaking of the glass retorts. I myself having met with the same inconvenience, the idea suggested itself to me to use iron retorts. I had one made of rolled iron, fourteen inches long by six inches wide, outside measure, of a quarter of an inch thick, the joints being brazed together and perfectly air-tight. The bottom of the bottle is convex outside and concave inside, and the top opening is one inch wide, with a threaded screw inside the mouth of the bottle. To this is attached a tube two feet long with a threaded screw, to enable the unscrewing of the tube, in order to put the nitrate of ammonia into the bottle. The iron tube is bent at a curve just above the mouth of the bottle, and is two feet long, and the other end of the tube being on a level with the mouth of the bottle, the bottle can be either suspended or placed over a gas-burner or on a fire.

The first time using the iron bottle it will be necessary to put into it two ounces of nitrate of ammonia, and apply to the wash-bottles the iron tube, and then the heat to the iron bottle. This process enamels the interior of the bottle and acts upon the iron, throwing off the oxide of iron which is produced by the nitrate of ammonia, the oxide of iron passing over into the dip-bottle and the gas into the others. After the whole of the nitrate of ammonia is evaporated, which is easily ascertained by the cessation of action of the solution in the glass bottles, the bottle then can be taken down, and, on being washed out with water, will be ever after fit for use, as this manipulation is only once required.

I use three glass bottles, such as are generally employed The first is connected with the iron tube, and is known as the dip-bottle. In this one I place about a quart of water with five drops (not more) of aqua ammoniæ. The surplus oxide of iron which forms itself will be found to remain in the bottle. The second bottle contains two quarts of water, a quarter of a pound of sulphate of iron, and a teaspoonful of sulphuric acid. Into the third bottle I place two quarts of water, and one ounce of carbonate of soda, instead of caustic potash, generally used. By this method I can make two thousand five hundred quarts of pure gas in two hours with the greatest ease.

Care must be taken when white fumes are seen in the glass bottles to reduce the heat so as not to make noxious gas. Any one, if so desirous, can affix to the iron bottle a thermometer, so as to be able to survey the effects of heat on the nitrate of ammonia. The heat should never be allowed to rise above 482° Fahrenheit, for beyond that noxious products are generated.—Alex. Berhard, D.D.S., *Paris, France.*

Resection of the Superior Maxillary.—Mr. P., a native of England, but now a resident of Hiogo, Japan, two years ago had an attack of syphilis, which was not, however, followed by any secondary symptoms of importance until quite recently. About six months ago he also passed through a severe attack of small-pox. For more than a year he has complained of pain in the region of the left upper jaw, at times so severe that narcotics were necessary. For six months the pain, which before was remittent, became constant, and the fœtor arising from a necrosed alveolus of an extracted lateral rendered the patient a burden to himself as well as his friends. The case was under the care of Dr. Harris, who upon my arrival kindly transferred it to me. Upon examination, I found that there was quite extensive necrosis of the jaw, there being superficial evidences of it at two points, the lateral and the first molar. The discharge from the dead bone was fœtid in the extreme, notwithstanding the patient's efforts to disguise it with perfume. Nearly all the teeth of the jaw were *in situ*, but loose, particularly so on the affected side. As the patient was desirous of speedy relief, an early day was appointed for the operation.

June 4th.—Assisted by Drs. Harris, Thornicraft and Berry, the patient being under the influence of chloroform, I extracted all the teeth on the affected side, cut through the integuments on a line with the dental spaces, dissected the periosteum upward and downward, passed the knife into the palatal suture, and detached the necrosed bone with the aid of a bone forceps. The detached portion was large, involving the bone from the palatal suture to the zygomatic process, including the entire alveolus and the inferior turbinated bone, and extending up nearly to the orbital plate.

The patient recovered rapidly from the effects of the anæsthetic, and in two weeks was attending to business; the pain having passed off, and there being but little offensive discharge. The voice is perceptibly injured, but this can to some extent be remedied by artificial means. I believe the only peculiarities in this operation are the successful removal of so large a piece of bone through the mouth, and the retention of the roof of the mouth intact, although its bony support was removed.—W. St. Geo. Elliott, M.D., D.D.S.

A Capping for Exposed Nerves.—As destroying nerves has become one of the things of the past, it becomes necessary frequently to intervene a non-conducting material between the exposed nerve and the metal filling. When the cavity is ready for the filling, cut a piece of isinglass plaster so as nicely to fit the bottom or wall of exposure of the cavity; wet it by immersing in water, then place it upon the palm of the hand. In a few minutes the moisture and the warmth of the hand will make it perfectly soft and pliable. Then with the foil carriers place it in position, and with a pellet of cotton merely moistened (not wet or saturated) with water, gently press it so as to make it conform to the cavity. On withdrawing the cotton the plaster does not come away with it as it would if dry cotton were used. With the syringe throw a current of dry air into the cavity until the plaster is perfectly dry. Now you can apply the oxychloride of zinc in any of its various forms, and fill without the fear of the capping coming away while introducing the filling. In this way the pain ordinarily caused by the application of the oxychloride to an exposed nerve is almost entirely avoided. I have frequently used it in this way, without causing the least pain to *the patient whatever.*—E. C. Moore, D.D.S., *Meadville, Pa.*

CHRONIC ABSCESS OF THE CHEEK.—A widow lady, aged twenty-eight years, of nervo-bilious temperament, presented for treatment. This case was of two years' standing. During this time she had had two attacks of intermittent fever; appetite poor; greatly depressed in spirits; left side of the face much swollen; suffering excruciating neuralgic pain at intervals; deglutition and mastication much impaired; much mental anxiety regarding her recovery; liver torpid, and the digestive functions deranged. Had been under medical treatment from time to time, without any permanent relief, especially so far as the local trouble was concerned.

Upon examination, the soft tissues of the cheek were found to be involved. About the center, opposite the second molar, was noticed a discolored patch of a dark yellowish-green tint, the size of a shilling, underlying the cutis.

A thin aqueous fluid could be seen underlying this, resembling much that of a blister recently drawn, save the cuticle was not puffed up, but rather sunken in appearance. The sieve-like opening usually to be seen in "chronic" cases was at this time closed, and the purulent fluid was making its way downward toward the base of the jaw.

An examination of the inferior molars of the left side was then made, and all were exempt from caries except the second molar, which had a very slight opaque, dry, carious line, extending along the fissures, but scarcely penetrating through the enamel, the six-year old molar being absent.

The tooth was not sensitive under percussion; no opening through the alveolar wall to the gum, this having closed subsequent to the second fistulous canal, making inroad upon the integuments of the cheek. The enamel, however, presented that characteristic appearance which is shown when nutrition has been cut off; it was decided from this pathological sign that the pulp from some cause had lost its vitality, suppurated, and caused alveolar abscess, and finally, for want of proper treatment, terminated in chronic abscess.

The jaw was short, the wisdom tooth very ill developed, with an overlapping projection of more than two-thirds of the gum; the opposing tooth coming in contact in the occlusion of the jaw causing ulceration of that part and inflammation in the fauces; mastication and deglutition being much interfered with.

Treatment (local). The removal of the molar and wisdom teeth. This was, however, performed with reluctance. Had the patient presented sooner, those teeth could have been saved. It is always well to save a tooth when it is possible so to do, but it is still better to sacrifice a tooth or teeth when they are found to be exciting trouble than to lose a part of the jaw.

After the removal of the teeth, a probe could be carried under the alveolar process from the socket of the second molar, backward and upward towards the wisdom tooth, and outward until it could be felt near the outer surface of the cheek.

The sockets and this canal were cleaned out thoroughly, first with tepid water, then with twelve parts water to one part phénol sodique, thrown up with a syringe; a dressing of diluted tincture of iodine was used alternately with the phénol daily, for a few days, keeping the inside parts from healing too quickly, until healthy formation could be seen on the surface of the ulcerated part.

Take care not to allow the agent to break or lacerate the cutis, which should always be kept intact; but if an exit to the pus must be made, an incision with a sharp lancet, making a clean cut, will avoid what otherwise might be an unsightly cicatrice.

A gargle was directed to be used for a few times, and the gum around the socket of the wisdom tooth painted with tincture of iodine twice a day. A compress was laid on the cheek, and a bandage carried around the jaw to support the muscles until the swelling had subsided.

The general treatment consisted in the evacuation of the bowels, with a view to the restoration of the liver to its normal functions, followed by tonic treatment. Free exercise in the open air was recommended, together with a nutritious diet and rest. The patient recovered her usual health and vigor in due time, and left shortly afterwards on a tour to the Western States —J. S. SMITH, D.D S., *Columbia*, *Pa.*

LAST spring I invested about twenty-five dollars in as many celluloid plates, and bought the celluloid apparatus complete, and followed instructions to the letter. One by one they came back on my hands, until to-day the last one, I believe, has come in, for which I thank Heaven. Some turned black as ink directly. Others, well fitting and satisfactory at first, gradually warped out of shape and fit. Others, after two or three months' wear, began to *shed the teeth.* In some I used plain, in others gum teeth. When the celluloid in the plain teeth turned black between the teeth, they looked like the deuce, and gave black satisfaction.

Will some one who has so highly *indorsed* the material as a base tell me " what's the matter," and whether they have had any " better luck ?"—H. P. SOUTHWICK.

WITH this I send you a small piece of the blade of a forcep which was broken by a dentist in the extraction of an inferior molar tooth and left in the alveolus. The patient had endured agony for months, and was almost demented by his sufferings. There was no tooth nor sign of a root from the cuspid on the affected side to the angle of the ramus, and the alveolar processes were obliterated. On making pressure with the finger the tenderness was extreme, and, guided by the sensation of the patient, enabled me to locate the trouble. Cutting down on the lingual side, I found and removed the specimen, weighing six grains, which had almost cost the patient his reason.—G. A. M.

I ALSO have had an experience with " celluloid." I prepared for a full plate of the amber-colored material, and when about to "screw down,"—my thermometer being as I thought all right, and registering 300° F.,—was surprised to see a dense smoke issuing from the flask. Upon removing the flask from the oil, I found that the celluloid had " gone up."—G. A. M.

REPAIRING CELLULOID CASES.—To fasten loose or fallen teeth on celluloid plates, dissolve the base in nine parts sulphuric ether and one of alcohol, to about the consistency of thick cream. Drill retaining points in the plate where the teeth are to be attached ; wet the part with a few drops sulphuric ether ; immediately rub a portion of the dissolved base on the part, and on the tooth till it adheres ; then work into the mass as much of coarse filings of celluloid base as you can while adjusting the tooth, and in a short time it will set firm enough to burnish up. If it stands two or three hours, it will be as hard as the rest of the plate. If too much of the filings have been used, two or three drops of sulphuric ether will smooth down and unite the parts, if applied while yet soft.—S. P.